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REVIEW OF MILITARY LITERATURE

THE COMMAND AND GENERAL STAFF SCHOOL QUARTERLY

Editor
MAJOR FRED DURING

FOREWORD

The object of this publication is a systematic review of current military literature, through cataloging articles of professional value, in selected military and naval periodicals, in the domestic and foreign field.

Articles from foreign periodicals are treated by translations of titles and digests of contents; material of particular importance is covered more extensively in a Section of "Abstracts of Foreign-language Articles."

A "Library Bulletin" Section lists books, recently accessioned, which are of particular significance.

This Review is published as a guide to modern military tendencies and to inspire vigorous thought on the subjects treated.

The opinions expressed by authors are not necessarily official.

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REVIEW OF MILITARY LITERATURE

Volume XV December, 1935 Number 59

CONTENTS

Page

Section 1—ORIGINAL MILITARY STUDY 5

Section 2—ABSTRACTS OF FOREIGN-LANGUAGE ARTICLES 27
This Section contains abstracts of important articles from foreign military periodicals; the remaining articles for each magazine are listed in Section 4.

Section 3—DIRECTORY OF PERIODICALS 109
A guide to Section 4 and Section 7.

Section 4—CATALOG OF SELECTED PERIODICAL ARTICLES 111
A systematic review of the contents of selected military periodicals; the articles contained therein are listed in numerical sequence. In English-language magazines, only titles are quoted. Foreign-language periodicals are covered in greater detail; articles are digested to a degree to furnish an adequate idea of contents and significance.

Section 5—ACADEMIC NOTES, C. & G.S.S. 177
Reprint of current School memoranda, which affect instructional procedure or tactical doctrine.

Section 6—LIBRARY BULLETIN 241
This Section lists books, recently accessioned, which are of particular significance.

Section 7—READERS' GUIDE AND SUBJECT INDEX 245
All subject-headings are arranged in alphabetic sequence and can be consulted like a dictionary. Note also List of Periodicals Indexed and Key to Abbreviations.

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LIST OF CONTRIBUTORS

	A	B	C	D
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(5) During, Maj. F.	5	29	3	
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A—Foreign-language Periodicals; B—English-language Periodicals; C—Abstracts of Foreign-language Articles; D—Original Studies.

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Maj. J.J. Waters: *Revista del Ejercito y de la Marina* (April, May, June 1935).

Section 1

ORIGINAL MILITARY STUDY

THE STRUGGLE AGAINST OVERWHELMING ODDS

By Lieutenant General Friedrich von Boetticher
German Army

Let us recall for a moment the situation confronting the Prussian King, Frederick the Great, in 1756 when the great struggle began:

Three women were spinning the threads of the net in which Prussia's king was to be caught: In Vienna—the greatest of them—the Empress Maria Theresa, who could not get over the loss of Silesia; in Paris, Madame Pompadour, deeply offended by the sarcastic words that came from the Prussian King in Sanssouci; and the third in St. Petersburg, the Czarina Elizabeth.

And a ring closed around little Prussia that had dared to establish within Germany a state claiming the rights of a large power. In the Electorate of Saxony, however, Count Brühl intended to play a clever game, pretending to remain neutral and, as he wrote to the Czarina, intervene "only when the knight is no longer firm in his saddle."

The man at Sanssouci sensed the danger. *Praevenire quam praeveniri.* "There is nothing for me to do but to surprise rather than be taken by surprise." Saxony must be occupied thus leaving in the hands of Prussia a stronghold which in the possession of Austria would separate Silesia from Prussia, a factor which, from the outset, would leave for Prussia no prospects whatever of winning the war.

The Prussian King had hoped that his unexpected advance into Saxony in 1756—his manifesto proving conclusively who was to be blamed for the war, his declaration that he would immediately evacuate the area and did not wish to conquer, if only peace was concluded, his victory at Lobositz —all of these facts combined, so he had hoped, would rend asunder the alliance of adversaries that had formed around him, and would save Prussia the struggle against the whole

of Europe, the struggle of inferior forces against superior numbers.

This hope was not fulfilled.

Late in 1756, fully realizing what was ahead, the king wrote from Dresden, where he had spent the winter at the Brühl palace: "The minor events that have happened this year are only a prelude to what the next year will bring, and we have accomplished nothing until we have done what Caesar did at Pharsalus."

And what was it that Caesar did at Pharsalus? With inferior numbers he brought about a decisive victory over Pompey's Army, a victory which assured his life's success. The problem of the struggle of inferior numbers against superior ones! Threatening, overpowering and terrible, this burden rested upon the king.

Filled with most strenuous work, the days at Dresden passed. Perhaps it was still possible to prevent France and Russia from forming an alliance against Prussia; perhaps Holland—together with George II, the English king and at the same time Elector of Hanover—may offer a counter balance against France. The army must be increased. Work, nothing but work. Only infrequently a few hours of recreation in the picture gallery, at a concert or at a sermon at the Church of our Lady (Frauenkirche). "I have to give many instructions regarding the troops, the country, the next campaign and similar miserable things which insane politicians consider of great importance," the king wrote to his favorite sister in Bayreuth.

"Miserable things," he sarcastically called his work that winter in which he found little time for poetry and philosophy. Strange how he, who at times was a man of cold reason, in this instance so belittled what was achieved by reason and logic. Strange also that in his opinion entirely different things seem to constitute the sustaining power in life: the things borne in the heart rather than in the mind. Two souls live within his breast—apparently in conflict with, yet supplementing each other: The contrast between world and God, between reality and the imaginary, between the temporal and the eternal, between our mortal strife and struggle and the forever unfathomable.

How many hardships were weighing down the king that winter when Russia, in February, decided to go against him, France pledged herself to the alliance and Sweden joined it also. 150,000 men from Austria, 115,000 from France, 80,000 from Russia, 20,000 from Sweden: all in all 365,000, and only 150,000 Prussians at the most against them. Only a few were allowed to know of the cares and anxieties that filled the king's mind in this situation; the others were made to believe that he was confident and assured. His brothers, the weak August Wilhelm, and Heinrich, forever envious and critical, regarded him with jealousy. Schwerin, the man of the world, still vigorous in spite of his 72 years, whose European fame as a field marshal was worth a whole army, was, however, not congenial enough to be the king's confidant. One friend alone occasionally had a glimpse into his inmost feelings and that was Lieutenant General von Winterfeldt, who was with Schwerin in Silesia.

How reassuringly the king wrote to his worried sister Wilhelmine: "I am not afraid of all the great plans my foes are working out. I am starting to tune my flutes and feel sure that at the beginning of the next campaign I shall teach those people a lesson who are now talking so boastfully. This spring will show what Prussia means and that through our strength, especially our discipline, we shall be able to cope with the great number of Austrians, the fury of the French, the savagery of the Russians, the hard blows of the Hungarians, and with whatever other adversaries we may have." But in his letters to Winterfeldt there was quite a different tenor: "Every battle that we fight must be a big step toward the destruction of the enemy." And at the end of the year he wrote: "Our present situation is no child's play—but a matter of life or death." And at the beginning of March when at least the number of adversaries seemed certain, he wrote: "Hard and desperate struggle will mark this year, but one has to keep up courage and everyone who honors and loves his fatherland will sacrifice everything for it."

In January he visited Berlin, the last time—as it proved—for more than six years. He stayed with his aging, beloved mother in whom he had always confided during the difficult years of his youth. He wrote his last will, a document which he entrusted to his childhood friend, the minister Count

Finckenstein. In it we find the following passages:

"Should I be killed, the affairs must go on without the slightest change and in such a way that it is not even noticeable that they are in others hands."

"Should I have the misfortune to be taken prisoner by the enemy, I forbid that the slightest consideration be given to my person, or attention be paid to what I may write from my imprisonment. Should such misfortune befall me, I want to sacrifice myself to the state. In that case, allegiance is to be given to my brother who—like my ministers and generals—is responsible that neither a piece of land nor a ransom be offered on my account and that the war is continued merely upon martial considerations just as if I had never lived."

This was the Prussian, the leader of inferior numbers. His adversaries, however, had pledged themselves not to lay down their arms until this Prussian was defeated and utterly crushed. Providently, they had already planned how the map of Europe was to emerge. There was not much left for Prussia. If the world represents just a problem to be solved by logical calculation, then Maria Theresa's utterance was correct that "according to human conception one can only conclude that the Prussian king cannot possibly defend himself on all sides and resist for any length of time the superior forces bearing down upon him." Ah, if history were only logic to be judged by human conception.

Now the lonely man at the Brühl palace in Dresden was pondering over maps, pondering also over the almost insolvable problem of fighting against superior numbers. It would take some time before the French would be able to march in from the West, the Russians and Swedes from the East. But the Austrians were likely to throw their overwhelming strength on Saxony. There the king intended to face them with his main forces, retaining a strategical defensive position until then. Then he intended to retaliate with a powerful blow, as he did twelve years ago at Hohenfriedeberg, and—so he pondered—"when the Austrians have been properly whipped the other nations will soon lose some of their arrogance." Then the Prussian Army will fight the French troops advancing across the Rhine and Weser, and the Russians may perhaps lose their desire to march in at all.

Is one man alone to come to such decisions? It surely was not beneath his dignity to ask the two best advisors for their opinion and to write to Schwerin and Winterfeldt in Silesia. Soon their answers arrived. Winterfeldt, the man who could boast "that he never had a secret from His Majesty," did not at all approve of the plan. If one gave the Austrians time to wait until the Frenchmen had come in—which is identical with leaving all the advantages to the enemy—then one might approve of the king's plan. "But God forbid," he wrote in unmistakable language, "that we may be thus embarrassed and have to take such measures." And now Winterfeldt suggested exactly the opposite of the king's plan; he suggested attacking Bohemia. Schwerin was of similar opinion. The king did not mind the outspoken criticism coming from these deserving men. He let himself be influenced and became doubtful. "The project is admirable," he wrote to Winterfeldt. And now a fine exchange of letters ensued. By constantly raising new objections the king compelled his advisors to define their stand. Finally, he sent General von der Goltz to Silesia with the order "to raise all possible difficulties." "I bring these difficulties," said the king, "so that Winterfeldt will be compelled to eliminate them; then I shall make my final decision."

The king himself, therefore, was to have the last word. But his trusted advisors were to cooperate with him in working out his plans. Fate determined which decision would lead to success: either the first plan conceived by the king—that of a "Cunctator"—that is the strategy of waiting, or the second one, that of "Hannibal," to take the offensive, into which latter plan the king allowed himself to be persuaded by his friends. "It is to be a 'coup d'eclat'," the king said, "which shall encourage our friends, discourage our foes, calm the timid and drive the lazy ones to a decision."

But while coolly and resourcefully making plans for the campaign, he wrote to his sister Amalie with that tone which was so apart from logic and yet so much a part of him:

"Remain aloof from all events; think of the fatherland and do not forget that its defense is our first duty. If you hear that misfortune has come to one of us, inquire whether he fell in battle. If so, thank God. For us there is only death or victory; it has to be one or the other. Everyone here

thinks the same. You would not want to have everyone sacrificing his life for the state and not have your brothers setting the example? No, my dear sister, in such times there can be special consideration for no one. To the heights of fame or to extinction—that is the question. The next campaign means to us what that of Pharsalus meant to the Romans, that of Leuktra to the Greeks. These are changing times which will decide everything and alter the face of Europe. This is our situation. One must not despair but be prepared for anything and must bear with the same countenance what fate may hold in store for us, no arrogance at times of success, no down-heartedness at times of adversity."

And so the final plan shaped itself. On the 15th of April, the advance into Bohemia was to take place. The king himself coming from Saxony west of the Elbe, was leading the main forces, Schwerin was commanding the Silesian troops, and the Duke of Brunswick-Bevern, with a smaller detachment, came from the neighborhood of Zittau and operated between the other two columns. The main concern of the king was to unite these columns, all advancing separately, with the sole object in mind of defeating the Austrian main forces, whom he expected to encounter near the river Eger or north of Prague. Within six weeks all should be decided. Then Frederick intended to throw his army to the west against the French and bring substantial reinforcement to the allied Hanoverians fighting there under the command of the Duke of Cumberland.

But at this point Schwerin caused trouble. He had been allowed to give advice in working out the plans, and now he wanted to act according to his own ideas and to have a little campaign of his own in the eastern part of Bohemia. Immediately strict orders were issued to him: "No matter whether you defeat the enemy or not, I order you to advance toward the Elbe. The fate of the state depends on your conduct. If you do not act according to my orders you forfeit your head." The king rigidly concentrated upon one aim, the great battle, at which the individual columns were to unite, facing the main forces without paying attention as to whether smaller Austrian units might invade Silesia, as feared by Schwerin. In Schwerin's case the king gave him specific orders; to General Field Marshal von Lehwaldt in far-off East Prussia, however,

he forwarded only general instructions and allowed him to act on his own initiative. "I cannot give you orders but you have to act according to circumstances." "If it is true that the Russians are really bent on marching and want to attack Prussia, then there is no course open to you but to take the first one that comes along by the ear and make an example of him."

And now that all these orders had been given and the time for counsel was passed and the time for action had arrived, the king's old ironical sense of humor returned. When the princes of Anhalt wrote that "with all due respect" they wanted to stay out of the war, the king noted on the letter that they should be told in reply: "Your neutrality will agree with you just as eating grass agrees with a dog." And then his tendency to imbue his generals with self-reliance! The ever-timid Bevern had won a fine victory south of Zittau shortly after crossing the border. "Now you see for yourself that things will go well once you get at them and start out with a good plan." And to the old Schwerin to whom, shortly before, he had to write in such outspoken language, he now wrote cordially and as a friend: "Everything is going splendidly, my dear Marshal. Our secret has been well kept, the enemy has been surprised; everything else will turn out the way we, as military men, anticipated."

But it did not turn out that way. It is true that at Prague the king, with inferior forces, achieved tactical superiority because he had concentrated all forces. But the decisive stroke he had planned failed to materialize. This day of Prague was, undoubtedly, a great victory, but on that day also the pillars of the Prussian infantry crumbled; a great day but paid for too dearly by the loss of an irreplaceable man, Schwerin. A great day of fame, which resounded through all Europe, but no decision was reached. The Austrian main forces were in Prague, but not yet captured; the second army of the Empress under Daun was in the open field; the crisis of the Bohemian campaign was approaching.

The king had never suffered defeat. Once he had uttered the proud words: "I am sending prayers to heaven that Prussia may never be defeated and I venture to say that she never will be as long as she has a good leader and is kept in proper discipline." Why should he fear defeat this time? There

was no time to lose. Prague had an abundant supply of provisions. The city would not soon surrender. But the French had meanwhile advanced across the Rhine. If the king delayed too long in sending reinforcements to that scene of operations, there was danger of the Hanoverians and Hessians being defeated or deserting the king. Something decisive must happen soon in Bohemia.

The 18th of June brought the decisive battle at Kolin. 33,000 Prussians had been available for the advance against Daun. All other forces were tied up before Prague. 33,000 Prussians against 54,000 Austrians! And on this battlefield was buried the fame of the invincibility of Prussia and its king. "Don't you know that everyone's luck must some day meet with reverses? I believe that I shall now have mine," the king said to his companion while riding from the battlefield towards Prague.

He was scarcely aware that his luck had turned when he immediately sent an order to Prince Henry, who was besieging Prague, to give up the siege. The great plan had failed. The most important thing now was to regain freedom of movement because the strength of the Prussian Army was in waging a mobile war. Combat in fixed position had to be avoided at all costs.

Dead tired after a 36-hours' ride, the king arrived at the gates of Prague. He confided all his grief to his brother Henry who was to prepare the retreat, and he did it in a masterly manner, being great as a soldier but small as a man. Henry and all the others who had been jealous of the king, now triumphantly pointed out that they had, of course, long known that this tragedy was bound to come. And Henry wrote to his sister Amalie that malicious letter which—not to the fame of its author—fell into the hands of the Austrians. "Phaeton has been struck. Phaeton has taken care of his own person and has retreated before the battle was decided by absolute defeat. He discovered the art of destroying within six weeks the work of thirty years; this fine, incomparable army, the main-stay of Prussia's greatness." The king was becoming more and more lonely and bitter. The road to fame for a leader is full of bitter experiences and disappointments.

After a few hours' rest the king regained his buoyancy. "With colors flying and with great zeal" he retreated from Prague. "Superbly the King of Prussia bears his misfortune even though it is the first of its kind he ever experienced," reported the English Ambassador Mitchell, the king's constant companion. His self-confidence had returned and with it strength and steadfastness which alone supported him in this struggle against overwhelming odds. "He who does not know how to resist misfortune is not worthy of good luck either; one has to be aloof of events, do one's duty and not complain about reverses which are the unavoidable lot of human beings," wrote this royal hero-heart. And his undaunted hope returned, that quality which always anew lent him power of resistance, that hope—so often disappointed —but which also gave him strength to achieve the highest at the decisive moment. "One happy hour may bring back to us supremacy over our enemies; but should that not be attained then we have to fight to the end for the good of the state," he wrote at that time.

Then more bad tidings came. It was said the French had crossed the Weser. East Prussia was threatened by attack from the Russians, about three times as strong as the Prussian forces there under Lehwaldt. And in Pomerania the Swedes were expected to land. The ally, England, did not land in France, nor did it sent troops to Hanover, or send the fleet to the Baltic Sea against the Russians as the king had hoped.

Should not attempts be made for peace negotiations with France. "Sister Wilhelmine, making use of your good connections, find out on what terms France would conclude peace." But the sounding should only be done on a personal basis. "The impression must not be conveyed that the king himself wants to negotiate." Then Count von Neuwied reported French inquiries concerning peace. Count von Neuwied was instructed to inform the negotiators as follows: "I set my honor above everything and shall never agree to humilating peace terms."

The king became more and more aware of his situation; he was no longer merely thinking of Prussia but of the whole of Germany: "Germany is now passing through a dreadful crisis; I am forced, single-handed, to defend her freedom, rights

and religion; if I am defeated Germany's fate is also sealed. But I have strong hopes. No matter how numerous my foes may be, I rely upon my good cause, the admirable value of my troops and the devotion inspiring all from marshal down to the ordinary soldier."

Misfortune after misfortune! His dearly beloved mother died. The king was terribly upset. But—as his faithful secretary, Eichel, recorded—"he immediately considers what in the face of these critical circumstances he owes to the state and its most faithful subjects."

More misfortune! His brother, August Wilhelm, whom he had entrusted with the command of the troops retreating on the right side of the Elbe into Saxony, failed him completely. The enemy in that region won one victory after another. A "breached-in-wall" the king called himself in a letter to his friend d'Argens. "Do not think, however, that I shall capitulate. Even if the heavens fall I shall allow myself to be buried under their debris in the same cold blood as I am writing you now. In such terrible times one's heart must be of iron so that there is no room for sentiment."

More misfortune was in store for the king. His brother lost Zittau with its abundant and almost indispensable supplies. The communications between Saxony and Silesia were interrupted. But the king acted swiftly. He intended to unite all available forces at Bautzen and to defeat the enemy forces at Zittau, no matter how strong they are. Paying no attention to the royal blood of his incapable brother he intended to relieve him of the command. He gave him orders to go to Dresden and forbade him staying in Berlin because "the cowards of the army shall not see a bad example in him." The king knew of no claim to command on account of noble birth. The state was at stake. His orders to his generals were sharp and cutting: "I cannot possibly concern myself with all your correspondence; I am not here to write. You have to hold Pirna and Dresden, and that is all. If anybody interferes give him a good beating and have patience until I am through here," he wrote to the Prince of Anhalt-Dessau in answer to an inquiry.

Still more reverses! The Duke of Cumberland, commanding the German troops in the north of Germany, was defeated by the French at Hastenbeck near Hameln, on July 26th. North Germany now was open to the French.

"Being the last knight of our league, I am the only one left ready to fight even if the battle were to be fought on the ruins of my fatherland," he wrote to Mitchell.

On the ruins of the fatherland! That is no empty phrase. The situation was clearly seen by the king! In East Prussia 30,000 Prussians under Lehwaldt against 90,000 Russians. At Greifswald 22,000 Swedes and no Prussian army to fight them. In Thuringia the Imperial Army and the French, 57,000 men in all, just about to unite, and again no Prussian forces to combat them. In Hanover the French main army, 75,000 men strong, before whom Cumberland was retreating almost without resistance. And the whole world believing that the last chapter of Prussian history was being written. In Saxony the king with a total number of 60,000 men, 40,000 of whom were under his command in the Lausitz where the Austrians were stationed at Zittau with twice as many men.

What was to be done? The king intended to throw his forces against the Austrians and again resume the desperate struggle against superior numbers. Defeat of the Austrians will free his hands, and he will be able to turn against the French. He found the Austrians in a strong position at Zittau. They were awaiting the attack. Prince Henry implored the king not to venture the attack. Henry and the rest of the pessimists saw salvation only in complete surrender. For the second time within the year, the king allowed himself to be dissuaded from his original plan and to be persuaded into the belief that the attack was impossible. The men of logic proved to him that the campaign would not be won: five armies with 320,000 men surrounding Prussia; Prussia in the center with 60,000 men in Saxony and 30,000 in East Prussia; no, the game could not be continued according to the rules of logic and the art of war. Rules of logic! But these small Prussian forces were led by a man who gave to logic only its proper place, the man who, in these eventful days found time to free himself of all his cares by giving expression to his thoughts in a poem to his sister at Bayreuth:

"I know that I a mortal am
And born to suffer pain
Defying the rigors of destiny
Steadfast I shall remain!"

And this man pulled himself together in spite of all the pessimists and men of logic; he split his small forces—an unheard of mistake, so the pessimists whispered—left 40,000 at Görlitz under the command of Bevern, and his friend Winterfeldt to protect Silesia from the Austrians, twice as strong in numbers. He himself, with 20,000 men, advanced to Thuringia to face there the Imperial and the French troops, totalling 57,000 men. Now he stood all alone; *alone* he had to make his decisions, contrary to the view of all others, in those days of misfortune. His decisions were no longer made after exchanging views with friends and experienced men, as it was done in those happier days that winter in Dresden. "These are hard times, God knows; and the situation is so tense that one needs a good deal of luck to come through all this," he wrote to Bevern. And then he wrote: "Now I must hasten against the French; they are *a portee*; the Imperial troops will afterwards get the *consilium abeundi* and then I shall have to go to the place where someone will get too close to me. I leave everything to you and give you a free hand to do or omit what is best in your judgment, always taking into consideration my situation as a whole. I think this will be the last letter you will receive from me for some time." The last letter; it was dated August 28th, from Harthau. Bevern had to protect Silesia. Winterfeldt had to see to it that the right things were done there. The king left for Thuringia. "The erring knight who will conquer or die," this is what he said of himself.

On the 6th of September, the king crossed the Pleisse south of Leipzig, on the 10th he reached Naumburg, on the 13th, Erfurt. One misfortune after the other! The enemy evaded and did not engage in the encounter the king had planned. More misfortune! Lehwaldt had been defeated by the Russians at Grossjägersdorf. Königsberg was threatened. Still more misfortune! "A stray message has come to me from the Lausitz which caused me great distress," the king wrote to his friend Winterfeldt. Immediately thereafter the "stray message" was confirmed: Winterfeldt lived no more; he was killed in action at Moys near Görlitz. Now Silesia's fate depended upon the timid and weak Bevern. Misfortune after misfortune! The Swedes were advancing towards Stettin, the Austrians towards Silesia. At the cloister

of Zeven the Hanoverian troops surrendered. The French main forces marched undisturbed towards Halberstadt and Magdeburg. 'What an unlucky year, that year of 1757! Schwerin dead, Winterfeldt dead, his mother, who had been so close to his heart, also dead. His great plan of taking the offensive in Bohemia had failed completely, Prussia's fame of invincibility buried on the battlefields of Kolin, the best troops of the army killed, the Prussian troops in East Prussia defeated, French troops advancing, Hanoverians defeated, Austrians advancing, Swedes advancing! Where was there any hope? Only within the heart of one; upon his steadfastness alone rested the fate of Prussia. This man opened his heart to his sister in Bayreuth in a long confession:

"I am fully determined to throw my strength against the troops of whatever hostile general comes nearest me. I shall even praise the heavens for granting me the favor of dying with sword in hand. How can a sovereign survive his state, the fame of his nation and his own honor?

"Survive? Firmness consists in resisting misfortune. Only a weakling submits to the yoke, patiently wears his fetters and passively endures oppression. I shall never be able to stand such shame. It is no longer left to me to do any good. Even if I should succeed in defeating two armies, the third one will overpower me. I am still firmly determined not to sign my name to the disgrace and shame of my house. Nature gave us life as a beneficial thing. When it ceases to be that, the contract terminates, and every human being has the right to end his sorrows if it seems fit to him. An actor who remains *on* the stage when nothing more is to be said, is hissed off the stage. The man whom misfortune befalls, is pitied just for the first few moments. Soon public opinion tires of sympathy; man's malicious criticism begins and it is argued that he must blame himself for all that happened to him; he is condemned and finally treated with contempt. At least it shall not be said of me that I survived the freedom of my fatherland and the greatness of my house!"

And what does the man, thus struggling, write to the defeated General Lehwaldt in East Prussia? "I see that your good conduct and bravery were not wanting and that it was not your fault that the outcome was not a happier one; you should, therefore, not be downcast but of good courage and assured that I shall remain your gracious king

and master now as before and shall do justice to you for your good conduct. I recommend to you chiefly not to take the matter unduly to heart but consider it a misfortune such as will come along in times of war. Inspire your officers and men with courage and keep up their good spirits and morale as well as you can."

During the fateful summer and autumn days of 1757, the king wrote more poetry than ordinarily. Strange? No, not so strange. In these reflections, day by day, a man tried to reach a higher plane from which to look upon events, even —day by day—to look into the face of eternity, that he may gain strength to bear the burden the world has laid upon him, that he may assert himself and lead others.

"Often, I feel inclined to intoxicate myself to drown my sorrows, but since I do not like to drink, I am diverted only by writing poetry, and as long as this diversion lasts I do not feel my misfortune."

He left no diplomatic measure untried to prevent the threatening downfall. In various ways he tried again to sound France hoping that negotiations would at least bring to him the advantage of delaying French operations, thus gaining time. He was ready to give the principality of Neufchâtel to Madame Pompadour for lifetime; but he was not ready to conclude peace at any price. He did not care to make peace unless things remained as they were prior to the war.

In a letter, Voltaire suggested that the king adapt himself to circumstances and be content with a peace involving losses. "A man who is a king *only* may be most unhappy if he loses territory; a philosopher, however, can do without that territory." Voltaire told him that such a conception would indicate new greatness. And this was the king's answer:

> "Voltaire may placidly the treasures of wisdom guard,
> While I by hurricanes and mishaps threatened hard
> Must to a harbor bring the ship in wild storm plying;
> I want to be a king in thinking, living, dying!"

Another man of pride was Plotho, the king's delegate to the diet at Regensburg. On the 14th of October, the notary, Aprill, wanted to serve on him an imperial summons for the king of Prussia. "What do you insinuate, you scoundrel," Plotho said, pushing the solemn imperial letter back into

Aprill's coat, shoved him out of the door and shouted to two orderlies: "Throw him down the stairs."

The king trained his men to have such pride, even during the darkest days when ruin seemed inevitable. Is this not perhaps one explanation why he won the struggle which seemed logically impossible, this struggle against overwhelming odds? Declaring to the outer world that one is unarmed and weak and showing no confidence in one's own ideas and actions will only make one sink all the deeper.

And again this king was proud, uncompromisingly proud. He advanced, the French retreated. He retreated and the foe followed him. The enemy wanted to tire him out, did not yet want to engage in battle. It was to be assumed that in the meantime the French main forces would unite with the Swedes before Magdeburg and that the Austrians would gain more ground in Silesia. The way to Berlin was open to the Austrians, who may threaten the city any day. Possible negotiations with France seemed to be broken off; not a soldier was to be expected from England, at the most a subsidiary payment. The king marched from one place to another in Thuringia, divided into three parts the weak forces he had there; all of these were insufficient emergency measures, holding no prospect of success. And Prince Henry, the man of logic, who could not understand at all that anybody should rather risk the last thing and prefer death to the disgrace of a peace without honor, proved point by point and with cutting logic that the war simply could not be won. For this reason, he argued sacrifices had to be made to get out of this hopeless situation. "Steadfastness at times of reverses," he said, "does not mean that one should insist on continuing a lost game, but that one should apply suitable means for preventing absolute ruin." The fate of Prussia was in the balance. Will logic be triumphant or that other power which leads nations on to the upward path?

The king did not just use phrases. He meant to think, live and die as a king. He was not even discouraged when, a few days after his conversation with Prince Henry, an Austrian division invaded Berlin. He will be strong again and cherish hope: "There is no crown and no throne which I wish to acquire by an unworthy action; a hundred times rather will I be doomed than commit one such deed during my life. I am now turning towards the Lausitz and count on finishing

my campaign there near Schweidnitz. The French will not hear from me but I hope to speak to them through my deeds so that they will be sorry for their arrogance when it is too late."

However the march into Silesia thus announced did not materialize. What had been desired for weeks now happened: the Imperial Army and Soubise were advancing in Thuringia; now, at last, the hoped-for encounter with this enemy would take place. As usual, when there was even a glimmer of hope so now the man whose hair had turned gray during these last few months, was imbued with his old buoyancy. "We must unite and make a powerful onslaught upon the enemy; one battle will decide it all"—this was his classic order to Field Marshal Keith, on the 3d of November. And two days later, the victory at Rossbach. That evening the king wrote to his sister in Bayreuth: "After so much tribulation heaven be praised for this favorable event. It will be said that 20,000 Prussians defeated 50,000 Frenchmen and Germans. Now I can go to my grave in peace—the renown and honor of my nation have been saved. We may be unhappy but not dishonorable." And now, who proved to be right: the men of logic weighing all facts with man's limited reason and through precise thinking, or the man who never gave up hope and preferred death to shame? It seems that the struggle against overwhelming odds can only be solved by a living example such as we have here. The problem refuses to be explained by logic and can only be fathomed as revelations of all great and ultimate things!

Bitter and disappointed at the king's success Voltaire wrote at that time: "Posterity will always marvel at the achievement of the elector of Brandenburg, who, after a great defeat by the Austrians, after complete annihilation of his allies, pursued in Prussia by 100,000 victorious Russians, pressed by two French armies who could attack him simultaneously, managed to resist them all, hold what he had conquered and win one of the most remarkable battles of the century."

Part of Voltaire's statement makes one think. Why was there no unanimous plan conceived during these last two months of September and October, by which the two French armies in Hanover and Thuringia, the Swedes in Pomerania, the Russians from East Prussia and the Austrians from Silesia would all advance against the man who, at Kolin, had lost

his reputation of being invincible and who had to withdraw from Zittau not having achieved his purpose? To be sure, there was a great deal of disunity in this coalition war. The marvel, however, that the king managed to defeat part of the enemy forces at Rossbach instead of being brought to his doom by the united forces, can be explained only by taking into account the personality of the man who stood far aloof from the instincts of the masses, who—amazing his countrymen as well as his adversaries—never lost his pride and his courage. This amazing and puzzling personality, therefore, was shunned; most unpleasant surprises were feared from him; one thought it best to safeguard oneself on all sides. After all, it seemed impossible that a man acting as he did, should be so near the abyss. The last and most profound explanation of the marvel is found in the moral force of the man who demanded of himself that he withstand the blows of fate by unbending firmness.

After Rossbach a new spirit awakened in the German nation. The abused, humiliated, politically and spiritually enslaved nation, at that time, threw off the bonds of the peace of Westphalia and once more became aware of its own worth and thus regained its pride. It was because a hero had arisen among the Germans. One only needs to read Goethe!

Only two days after Rossbach, on the 7th of November, new plans were made. "It is a very busy year for me," the the king wrote. He intended to send Field Marshal Keith with small forces into Bohemia in order to induce the Austrians, stationed in the Lausitz, to go to Bohemia. In Silesia the Austrians were splitting their forces; 30,000 men were besieging Schweidnitz. Bevern, therefore, no longer faced forces much stronger than his. The king immediately planned to take advantage of this fact. He sent orders to Bevern to attack the enemy: "I am convinced that with the help of God everything will go all right under your command and your good disposition, and that you will defeat the enemy." The king himself intended to hurry to Schweidnitz which should hold out until then. "In the meantime, my dear Duke, God willing, I beg you not to let weaklings intimidate you. Rely on your own judgment and experience. Your army is fresh—the enemy's however, is demoralized and weakened by having been sent away. To defeat the enemy at his weak-

est point, therefore, depends solely on your good planning, your countenance, bravery and vigor."

Thus, the king reflected on the situation as a whole.

Of the French and Imperial Armies only the French main forces in Hanover under Richelieu represented actual danger.

In that region the Prussian general, Prince Ferdinand of Brunswick, now took over the command of the Hanoverian troops. The king hoped that the French would soon be thrown back beyond the Weser. In East Prussia the situation had changed: the Russians were retreating, Lehwaldt was free. He received the orders to march to Pomerania to "disperse the Swedes." And in Silesia the Austrians had split their forces: one part was now before Schweidnitz and the other before Breslau. It could not be any other way but that Bevern would win a victory at Breslau and the king would free Schweidnitz. Within two weeks Silesia should be freed!

Thus the "erring knight" left Leipzig on the 12th of November to march to Silesia. But his bitter experiences had taught him to realize that fate might again be against him. "Nothing can be done without luck," he wrote worriedly.

And already his good luck had turned! On the 18th the distressing news that Bevern had not attacked, that Schweidnitz had capitulated, that the enemy once more had united its forces in Silesia. Thus Bevern's lack of resolution had upset everything! A letter full of bitterness and reproach goes to him. It was now to be expected that the enemy would throw its forces, many times stronger than those of the king, upon the advancing king if Bevern did not attack. "My dear Duke, once more I give you positive orders to go at the enemy, attack and defeat him, otherwise you will cause the whole host of enemies to come down upon me, get me into a mire and make us lose everything. You had better make good your blunders!"

But in all these reverses not a moment of wavering. The advance to Silesia was started with a view to cutting off the enemy from his lines of retreat into Bohemia. "In spite of it all, I shall not give up my plan—come what may, I shall make the greatest efforts to straighten things out. Be convinced that you will not see me again unless as a victor,"

the king wrote to his brother, Prince Henry. "Now I must trust myself to the whims of fate, must attempt the most difficult and reckless ventures in order to rescue Silesia and adjust the blunders of others."

If Bevern should defeat the enemy, the king intended to attack the Austrians from the rear. If, however, Bevern was defeated, he must then march towards Breslau to hold the fortress; and to that city the king directed his advance. Decision will come through Bevern's sortie from Breslau and also the king's attack. "I hereby forbid you again, my dear Duke," the king said in directions to Bevern, "all *Conseils de guerre* and discussions with your generals but I recommend you to make your own wise decisions, give your orders with authority and have your generals execute them upon forfeit of their lives."

Then, on the 24th, when the king was setting foot on Silesian soil, the news reached him that two days ago Bevern had after all won a victory over the Austrians!

Relieved of a heavy burden, the king breathed freely once more. To him it seemed an unheard of change of luck. Now fate had spared him the worst. Fate? Next evening detailed reports reached him. Bevern did not win the battle but the Austrians defeated him at Breslau!

"I know that I a mortal am
And born to suffer pain
Defying the rigors of destiny
Steadfast I shall remain!"

Would he now prove this? Luck changed, his generals failed him, fate did not spare him anything; only one thing remained unchanged: the steadfastness of this king. His orders to the wavering, timid Bevern had been sharp, but there was no reproach to the defeated man, just clear, concise orders! Detailed instructions how to hold Breslau. "Above all, I direct that if you should see the whole enemy forces concentrating upon me, you must march towards me, and I shall see how I can best join you."

More news! On the 24th, Bevern had been taken prisoner by the Austrians; in the general confusion Breslau was surrendered the same day. Zieten had taken over the command of the troops still available in Silesia. Not a moment of hesitation for the king, no complaints. He intended to

unite his forces with Zieten's and in this way hoped to have an army of more than 36,000 men with whom to attack the Austrians. Camly he faced the decisive battle which would bring him victory or death. Calmly he stipulated that in case of his death he wanted to be buried in "Sanssouci." "I do not want my body to lie in state, but want to be put in the grave without ceremonies and at night." "In the meantime we must wait. Our unrest in these days does not alter things; only that will happen which pleases 'Chance'."

And on the 2d of December Frederick's small forces united at Paschwitz with the Silesian troops commanded by Zieten. These regiments, which had been under an unsuccessful command and had just been defeated, were greeted by the king like victors. The guilty generals had been arrested but the subordinates were promoted. Everybody was seized with a new spirit. Why? Indeed, why? There was, after all, in this struggle of inferior numbers against superior forces a certain something that mocks all logic!

The king was absolutely alone: in his decisions he had to rely entirely upon himself. In those winter days he did not consult any one as he once did, discussing the campaign with Schwerin and Winterfeldt, who had both been claimed by death during this terrible year. Now no one could dissuade him from taking extreme measures as once before at Zittau when he refrained from the attack. Now he was all alone, but something emanated from this lonely man which was higher than reason.

The whole army to the last man was to engage in the struggle. No one was to be left in doubt about that. On the 3d of December he asked the generals and officers of his staff in Paschwitz to appear before him. He entered the assembly. The officers of the Silesian Army who had not seen him for six months, hardly recognized him; bent, with hair turned gray, deep lines in his face, haggard, worn-out and with a badly fitting uniform. But his great, god-like eyes shone with the same old fire, the same old splendor. And now he said with a voice full of its own peculiar harmony, words without rhetoric, which were effective because they came from a man who, through extreme sufferings, had long outgrown what ordinarily besets humanity:

"To you, gentlemen, it is known that Prince Karl of Lothringen succeeded in conquering Schweidnitz, defeating

the duke of Bevern and in making himself master of Breslau, while I was forced to check the advance of the French and the imperial troops. Part of Silesia, the capital and all our war supplies that had been stored there have been lost, and my adversities would be almost unbearable were it not for the unlimited trust I place in your courage, your steadfastness and your love for your fatherland which you have proved to me on so many occasions. It is with deepest gratitude that I recognize these services you have rendered the fatherland and me. There is hardly a man among you who has not distinguished himself by some great, honorable deed, and I flatter myself that—should occasion arise—you will not be wanting in bravery which the state may demand of you. This occasion is approaching! I should feel that I have not done my duty if I would leave the Austrians in possession of Silesia. Therefore, let me say this to you: I shall—contrary to all the rules of the art of war—attack the army of Prince Karl, almost three times stronger than ours. The question here is not the number of our foes nor the strength of their positions; all of this I hope to overcome by the great courage of my troops strictly following my orders. I have to venture this step or everything is lost. We must defeat the enemy or let ourselves be buried by his batteries. So I believe—and I shall act accordingly. Acquaint all officers of the army with my resolutions; prepare the ordinary soldier for the task he will soon have to face and let him know that I feel entitled to demand of him absolute obedience. If, after all, you remember that you are Prussians you surely will not want to be unworthy of that privilege: if, however, there is one among you who is afraid of sharing all dangers with me, he may resign today without suffering the slightest reproach from me."

Not a sound. Then Major von Billerbeck burst out: "It would only be an infamous scoundrel who would do that now!"—"I was convinced beforehand that none of you would desert me. I count on your faithful aid and on certain victory. Should I die and not be able to reward you for your services, the fatherland must do so. Now go to your camps and tell the regiments what you heard from me. Soon we shall have defeated the enemy or we shall never meet again!"

Thus two days later, on December 5th, an army believing in its leader went to battle west of Breslau, at Leuthen. It

was an army in which experienced warriors, such as the Duke Moritz of Anhalt, had, up to that address by the king, no longer believed in a possible turn of fate. And these men, marching towards the enemy on a dark and cold December morning were singing:

"Oh, let me do with zeal what should be done by me
Just where my duty calls me in the name of thee.
Oh, let me not delay that for which is great need.
And when I do it, help that I may well succeed!"

And these men were led by one who had now climbed the cold heights of solitary leadership, one who told his officers and men the full truth about the situation and his decisions, the man who on that 5th day of December fought for everything and achieved a feat which again stands above all logic, a feat which in its unheard of daring could only be ventured by one who knew only one alternative: victory or doom, honor or death.

Thus the campaign of 1757 ended with the day of Leuthen, with a victory wrought by inferior numbers over superior ones. And the king was hoping in his heart that this day would bring peace. But fate had in store for him five more years of hard blows. And again and again there was this struggle against odds which threatened to overwhelm him. But in all these years there stood a man tempered to the finest in the fires of experience.

"I know that I a mortal am
And born to suffer pain
Defying the rigors of destiny
Steadfast I shall remain!"

Section 2

ABSTRACTS OF FOREIGN-LANGUAGE ARTICLES

This section contains abstracts of important articles from foreign military periodicals; the remaining articles for each magazine are listed in Section 4.

CONTENTS

	Page
Abyssinia	27
Aircraft and Combat Vehicles versus Ground Troops	53
Motorization of Large Units	63
Modern Genghis Khan	72
Lessons from the Chaco War	79
Tank Attacks at Night	84
Motorization of the Japanese Army	95
Approach Marches	101

ABYSSINIA

A Military-Geographic Study

By Corporal F.W. Merten, U.S. Army

All of the African states were gradually annexed by the European colonial powers, except the Empire of Abyssinia—or Ethiopia, as it is called officially—which remained the only sovereign state on the dark continent (except Liberia). Next to Egypt and China, Ethiopia is one of the oldest states in the world. Twice the Ethiopians were forced, in the course of the last century, to take up arms in defense of their independence. In 1875, the Egyptians, under Munzinger Pasha, attempted to conquer Abyssinia, but were repulsed. While Italy was more fortunate in the beginning, she could not attribute her successes to the achievements of her own armed forces. The Abyssinians successfully opened the campaign and inflicted a serious defeat upon the Italians (25 January 1887), but were unable to carry the operations to a final victory. Mahdist forces had invaded Abyssinia from the west and, being considered the more dangerous enemy, had to be repulsed first. This was accomplished in the Battle of Metammeh (8 March 1889); it was in this battle that the

Abstracted from *Wissen und Wehr*, August 1935. "Abessinien. Eine wehrgeographische Betrachtung," by Friedrich Papenhusen.

then Emperor John IV was killed. He was succeeded by the famous Menelik II (1889-1913). Foreign entanglements being contrary to his newly acquired monarchical interests, Emperor Menelik II deferred the dispute with Italy by signing the Treaty of Ucialli (2 May 1889). The terms of this treaty definitely fixed the boundaries separating Italy's possessions from Abyssinia. Menelik furthermore obligated himself to deal with other nations exclusively through the Italian Government. Italy explanied this obligation as constituting a form of Italian protective rule. Ethiopia, however, protested against this interpretation of the Treaty. War ensued, and the Italians were completely defeated. The victory of Adowa (1 March 1896) and the peace of Addis Ababa (26 October 1896) gave Abyssinia her independence. In Article 3 of the peace treaty, Italy recognized without reservations the complete sovereignty of Ethiopia.

The defeat sustained by the Italian forces at Adowa is the most disastrous one that has ever been inflicted upon an European army by colored troops (except Cannae). The The Italian expeditionary forces were completely wiped out. Barely one-third of the contingent succeeded in retreating to the frontier. All guns as well as every field and combat train fell into the hands of the enemy. Broken was the conviction that Europe's arms could not be conquered. Africa triumphed over Europe. No wonder that this victory caused Abyssinia's prestige to be raised considerably in the eyes of the European powers and that the former's self-confidence grew.

Despite the fact that Italy solemnly declared, in 1896, that it would recognize Abyssinia's independence, and notwithstanding the fact that "permanent peace" and "everlasting friendship" were promised in a new treaty concluded in 1928 and reaffirmed in September, 1934, Italy never abandoned the hope of gaining possession of this resourceful country. When minor troubles arose at Gondar, Ual-Ual, and Lamaba, Italy mobilized two divisions. In the course of time, however, a force comprising more than 200,000 men was transported to Africa. These Italian soldiers were recruited in the main from South Tyrol whose natives are best fitted for mountain warfare. Whether these men will stand the African climate, is rather doubtful. Inclusive of the

troops still remaining in the garrisons at home, Italy now has at her disposal 640,000 men for service in East Africa. Inasmuch as Eritrea, Somaliland, Tripoli, and Lybia fail to meet Italy's demands and requirements, Italy might welcome a conflict for the purpose of acquiring further Abyssinian territory. This assumption is all the more plausible since an extension of the Italian colonies in any other direction may be accomplished only at the expense of Great Britain and France. Both these latter powers having met—that is, met at least from their own point of view—the obligations incurred by signing the secret Treaty of London (24 April 1915), they may no longer be expected to accommodate Italy. Finally, there is the fact that Japan is gaining a foothold in Abyssinia, which compels Italy to make a decision.

The Treaty of Rome (7 January 1935), which may well be regarded as the termination of the Treaty of London, so far as France is concerned, undoubtedly has influenced Italy's measures against Abyssinia. Along the shore of the Strait of Bab-el-Mandeb, France ceded to Italy a strip of land measuring approximately 600 square miles and extending to a point north of Obok. With regard to size, this territorial gain is of little consequence. Yet its strategic advantage is considerable. Italy not only has pushed forward to the Gulf of Aden, but, by acquiring the island of Dumerra, has gained also a position of great strategic importance. The construction of fortifications on this island would further enhance its strategic influence on the Straits and would be of no little importance for operations directed against Abyssinia.

Although Italy temporarily seemed to be adopting a conciliatory attitude, she was merely trying to gain time preparatory to the conflict and in order to camouflage her actual plans. For Abyssinia is an important factor in Italian foreign policy. This is proved by the expressions voiced by various Italian statesmen, which may be regarded as a reply to the rapprochement between Abyssinia and Japan. For instance, General de Bono declared that the key to Italy's expansion in East Africa may be found in Abyssinia, and that the ambitious and energetic youth of the rejuvenated Italy is entitled to such an expansion. This opinion is of particular importance in view of the fact that General de Bono was recently appointed Governor of Eritrea and Somaliland. The Assistant Secretary of Colonial Affairs has expressed himself

in a similar vein. In the latter's opinion—"Italy has no alternative but to adopt suitable measures to bring Abyssinia to her senses. The Ethiopian Empire is not pursuing a wise policy in opposing the economic evolution of the European nations, while flirting with Japan." In the end, the armed conflict which took place at Ual-Ual clearly demonstrates Italy's aggressive intentions. This incident has been referred to as a border conflict. This is a rather bold claim; for, even on Italian maps, Ual-Ual is located approximately 60 miles inland. Hence the Abyssinians were fully justified in attacking the Italian military camps that had been established in their own country.

Abyssinia is an inland state. It is separated from the Red Sea by Italian Eritrea which extends into the Plateau of Habesh. Tadjoura Bay, a part of the Gulf of Aden, is that part of the Indian Ocean which lies nearest to the Ethiopian Empire. It is here that the important harbor of Djibouti is located; this seaport constitutes Abyssinia's only port of entry that may be reached by rail. Djibouti, as well as a zone approximately 45 miles deep surrounding the port, belongs to France. Then there are British and Italian Somaliland which shut off Abyssinia completely from access to the sea. Against the interior, Ethiopia is blocked by British possessions.

Whereas, on the other hand, Abyssinia's geographical position in general may justly be considered unfavorable, the position of an inland state, on the other hand, offers certain advantages. Ethiopia owes her freedom and independence less to her recognition by Italy than to the circumstance that her territory is bounded by the possessions of the three great colonial powers. In a treaty signed 13 December 1906, France, Great Britain, and Italy declared that Ethiopia's integrity was favorable for all concerned and, therefore, should remain unchanged. In the event, however, that the political situation should change—with reference to the activities of Empress Taitu resulting from Menelik's illness—the three powers obligated themselves to a mutual safe-guarding of their interests. Article 4 of this treaty describes the interests in detail; it is from this description that we may glean that, notwithstanding those beautiful phrases full of love for Abyssinia, the three powers were actually considering an eventual partition of Abyssinia. Except for the jealousy of the three powers

concerned, this partitition probably would have materialized long ago.

Abyssinia's economic development and her present influence on the world market are so negligible, that the overtures made to Ethiopia by her neighbors are so difficult to comprehend. On the other hand, there is considerable opportunity for future development. If systematically exploited, especially with the aid of artificial irrigation, this country could furnish cotton, tobacco, coffee, tea, sisal, and many other products of tropical and semi-tropical agriculture. The Kolla, that is, the humid and hot region, is suitable for rubber plantations. The cattle industry, which at present lacks the benefits of a systematic and scientific management produces only hides, likewise could become more profitable because sufficient grazing land is available. Although geological exploration in Abyssinia is still in a state of incompleteness, considerable mineral deposits have been located. The mineral resources include gold, silver, platinum, iron, zinc, copper, and coal; yet little or nothing has been done in the way of exploitation. At present, economic importance is attached solely to the small but promising gold and platinum mining industry which rests in the hands of the French. The favorably located hard-coal beds near Lake Tana as well as the soft-coal beds at Debra Libanos, not far from Addis Ababa, also promise profitable returns.

The economic condition and the opportunities for future development in Abyssinia cause the Italians and French to cast covetous eyes at that country from their positions in the desert. Nor is Great Britain averse to securing certain sections for herself. Fortunately for Abyssinia, however, the interests of the neighbors conflict. In the following we shall briefly review these various interests.

The Plateau of Habesh, in the heart of Abyssinia, contains the source of the Sobat, the Blue Nile, and the Atbara rivers, all of which are of decisive importance for the water supply of the Nile. It is the abundance of water furnished by these rivers which renders possible the irrigation of the Nile country, for 95% of the water flowing below the mouth of the Atbara is derived from the Abyssinian Plateau. Deprived of this water supply, the Nile surely would run dry somewhere in the desert. The important dead vegetable matter, which gives the waters of the Nile their high degree of fer-

tility, is washed off the volcanic soil of the Plateau. We may justly claim, therefore, that the Abyssinians are sitting at the sources of Egypt's wealth and, by possessing Lake Tana, hold in their hands the destiny of Egypt.

By dynamiting certain banks of Lake Tana, it is said to be possible to guide the waters of the Blue Nile into Abyssinia and the Danakil Desert. Available maps fail to suggest, however, the procedure and place of executing such a plan. At any rate, the tale that Emperor David II once upon a time had dammed the Blue Nile, was sufficient to induce the British to increase their vigilance over the sources of the Nile. For this reason, the British forced a treaty (15 May 1902) upon the Abyssinians prohibiting the latter from constructing any works which might interfere with the normal flow of the waters toward the Nile. After the World War, Great Britain assumed the right of regulating the water supply of the Nile to suit her needs. In taking a stand against this pretension on the part of Great Britain, Abyssinia was supported by France; moreover, it was with the latter's aid that Ethiopia entered the League of Nations (1923). Notwithstanding all this, Italy and Great Britain concluded a treaty (1925) which once more was really a partition of Abyssinia. With a view to improving the control of the water supply of Blue Nile, Great Britain planned to construct reservoirs at Lake Tana. Any opposition that might arise was to be broken by Italy. In appreciation of this support, Italy was granted the right of constructing a railroad which was to lead from Eritrea straight through Abyssinia to Somaliland. This plan was vetoed, however, by the League of Nations who interceded more in behalf of the interests of France than of the sovereignty of Ethiopia. For, the construction of a railroad by Italy would disregard older rights granted to France; according to the terms of an agreement dated 9 March 1894, France possesses the exclusive right of building railroads in Abyssinia.

On the other hand, a materialization of the accord reached by Great Britain and Italy would not have equalized the conflicting interests of both parties concerned, but rather would have emphasized them. The railroad was to lead from Massaua via Asmara, Gondar, and Addis Ababa to Mogadiscio. Thus not only would there have been established communication between Eritrea and Somaliland that would

be unexposed to exterior influences, but Abyssinian commerce and trade would also have been delivered into the hands of Italy. Yet Italy is less in need of an expansion of her commercial sphere than of an outlet for her ever-increasing population at home. Each year, more than 100,000 Italians are compelled to emigrate because they are unable to earn a living wage in their native land. Naturally, it would be highly desirable for Italy to direct this stream of emigrants to her own territories, especially to such regions, which, if properly exploited, would supply Italy's industry with cotton and such other raw materials as may be produced in the colonies. While both Eritrea and Somaliland, by means of artificial irrigation, may yield richer crops than are produced at present, the climate renders these colonies unsuitable for settlement. The climate of the Abyssinian Plateau, on the other hand, is favorable for Europeans. In this area, there are still available 100,000 square miles of land which, counting an average of nine inhabitants for each square mile, would offer a home and work to many Europeans. Inasmuch as only one-tenth of the soil has been cultivated, Italy would gain an area of cultivable land which measures one-half the size of the mother-country. The railroad would lead to these regions which are most suitable for colonization. On the other hand, this same railroad would also pass through the region containing the sources of the various tributaries of the Nile, thus crossing the sphere of British interests. In order to derive profit from these regions, Italy would have to resort to artificial irrigation. It is questionable, however, whether Great Britain would permit Italy to tap the sources of the Nile, the use of which she denies Abyssinia. This doubt applies likewise, in the event that an Italian armed force should invade Abyssinia. In the same measure Great Britain seeks to dominate all routes that lead from and to India, and claims exclusive control over all waters of the Nile. That Great Britain regards this right very seriously is evidenced by an agreement into which she entered with Italy in 1924. This agreement grants Italy the right to draw a definite quantity of water from the Gash, a tributary of the Atbara, whose source is located on the Plateau of Eritrea, i.e., on Italian soil.

Italy's strategic influence upon the Strait of Bab-el-Mandeb, gained by the Treaty of Rome, would assume still greater importance, if Ethiopia were placed under Italian

rule. For Italy enjoys also a lively economic relationship with Yemen, situated on the other side of the Red Sea. Massaua serves as an important depository for the commerce carried on with that region of Arabia. It is doubtful whether Great Britain would consent to the acquisition of further territory in Abyssinia by Italy which would strengthen the latter's position along the Red Sea and in the Gulf of Aden.

Whereas British and Italian interests in Abyssinia are of a territorial character, those of France are primarily of a commercial one. The railroad Djibouti—Addis Ababa represents the means by which contact with the outside world is maintained. This railroad is controlled by France, which thus handles more than two-thirds of the entire import and export of the country. Owing to the geographical conditions of Ethiopia, Addis Ababa constitutes the political and economic center of the northern and western Plateau. Communication with the south and the highly important region of Harrar is maintained by means of the railroad. Naturally enough, the French seek to retain this economic preponderance which permits, moreover, of a political and cultural influence. It is for this reason that Italy was denied the right of constructing their railroad which undoubtedly would have been of great benefit to the country.

Yet the danger threatening French commerce was not removed by this protest raised against the plan of constructing the railroad. In an agreement dated 2 August 1928, Italy was conceded the right to build an automobile road which was to lead from Assab, on the Red Sea, to Dessie, in the interior of Abyssinia. The Ethiopian government entered into this agreement for the particular reason that Abyssinia was granted a free port zone in Assab which she had been denied in Djibouti. In view of the fact that import and export goods are dutiable in Djibouti, Abyssinia will take advantage of this new outlet once this road has been constructed. Taking this into consideration as well as the fact that French Somaliland, in the main, lives off her trade with Abyssinia, we may assume that a weakening of the Italian position in Abyssinia would be rather desirable for France. Djibouti, however, is not only a port of entry for Abyssinia—this gateway is the French parallel to the British Aden, a factor by means of which British interests may be guided into a channel convenient for France. Hence a strengthening of Italian rule

in this region, might ultimately become highly unsuitable for France.

Ethiopia, weary of the rival pressures exerted by these three European powers, began to seek friendship elsewhere and, in 1933, turned to Japan. The contacts maintained by these two nations are of a far-reaching nature. Japan has gained a concession to establish cotton plantations. For this purpose, as well as with the view to creating settlements, Japan received an area comprising approximately 8,000 square miles. Considering the size of the Empire, this is not a very large area. Moreover, for the present these plantations perhaps are regarded as a mere experiment. Far more important are the plans dealing with the construction of airports, the execution of which Italy has so far been able to prevent. Italy likewise was able to interfere with the proposed marriage of an Abyssinian prince with a lady belonging to the Japanese nobility; this marriage was to sanction the friendly relations established between Ethiopia and Japan. Yet, this diplomatic success on the part of Italy, in no wise altered the fact so highly dangerous for the entire world, namely, that two colored races, one of whom has assumed the position of a world power, have joined hands in their battle against the white race. The situation is as unpleasant for Great Britain as it is for Italy. The latter has to deal not only with Abyssinia but with Japan as well. Italy will have to fight Japan primarily in her struggle for Abyssinian cotton plantations and commerce. The weapons with which to carry out this struggle, however, are not evenly divided. As Italy possesses no favorable roads leading into the interior of Ethiopia, Japan may take advantage of the railroad Djibouti—Addis Ababa. Unlike Italy, Japan need not fear that France might attack her homeland. Besides, France might not even be averse to a friendship maintained between Japan and Abyssinia. At any rate, the relations between Japan and Abyssinia were initiated and fostered with the approval, not to say, aid, of France. Political conditions in Europe, it is true, have reduced the interest of France in Japan. An Ethiopian victory would also be a victory for Japan and, in turn, strengthen the position of France in Europe. In the event of an Italian defeat, Ethiopia and, with her, Japan will advance to the sea and the Strait of Bab-el-Mandeb. The consequent weakening of Italy would tend to increase the influence of France

in the Mediterranean. Far more important than this, however, is the fact that Japan, Great Britain's most dangerous enemy, is in a position to sever in eastern and southern Asia, the life-cord of the British Empire. Abyssinia not only flanks the line: Cairo—Calcutta, but the line: Cape—Cairo as well, which is of equal importance for the British Empire. The constant threat exercised by Japan from the Abyssinian Plateau toward the east and west would tend to curtail Great Britain's freedom of action in Europe, while raising the French position of predominence.

It is shown here for the second time that an Italian rule in Abyssinia would represent the lesser evil so far as Great Britain is concerned. Nevertheless Italy can hardly count on direct British support, because the struggle is directed not only against the Black Empire, but against the Yellow Race as well. Any intervention in Africa on the part of Great Britain which would favor Italy is bound to result in a Japanese advance in Asia. At present, Great Britain cannot afford to risk this danger. Hence, unless Italy should prefer a settlement reached by peaceful means, she will be left alone in her conflict with Ethiopia.

From the above we may conclude that Abyssinia constitutes one of the most important centers upon which the foreign policies of the four world powers are focused. It is to these contradictory policies that Abyssinia owed her existence and independence during the past four decades. Up to the present, Ethiopia has profited from the rivaling ambitions of her neighbors. The question, however, is whether Ethiopia today, as in 1896, is able to protect her freedom without receiving the support of other countries.

It seems almost as if the victory of Adowa had established once and for all that the people of Ethiopia will never be vanquished. One cannot deny that, on 1 March 1896, an army composed of white troops was annihilated by a colored mob—for, Menelik's forces could not be called by any other name. Nor can it be denied that on that day the latest developments in the military field were defeated by the all-conquering force of a bold and determined attack executed by savages. And yet, one should not commit the common error of concluding from this fact that Ethiopia is superior in the art of warfare. Notwithstanding the victory, the Battle of Adowa does not represent a reliable unit by which to measure the

military efficiency of that nation, for a series of misinterpreted orders caused the Italian troops to disperse and march straight into the trap laid by the enemy. The latter had only to attack in order to wipe out one unit after another. On the other hand, the Abyssinians encountered obstinate resistance wherever the Italian troops were led by an energetic commander. This is proved by the exploits of Dabormida's gallant brigade which launched six successive bayonet attacks and repulsed the Ethiopians in each instance. Nor is it an example of military superiority that on the Colle-Zala some 5,000 Abyssinians were contained by 120 Italian infantrymen and 115 Bersaglieris. Then, too, the initial engagements that took place at Coatit, Senafe, and Dobra-Ailat were unfavorable for Ethiopia. It is essential to recall these episodes in order to be able to arrive at a correct estimate of the coming events.

Information available regarding the Ethiopian army is inaccurate and contradictory. Estimates as to the strength vary from 500,000 men to 1,000,000 men. The equipment with modern arms in no wise corresponds to the number of soldiers. Recent illustrations showing the Ethiopian army failed to furnish a correct picture of the actual armament. At the beginning of the strained relations with Italy, the Ethiopian forces possessed from 200 to 300 machine guns besides the rifles carried by every Regular soldier. The artillery numbered 180 mountain guns (caliber 55-mm.). Considerable changes have been made since, but have not been published to the world. The supply of the necessary ammunition is a highly serious problem for Ethiopia. The small factory in Addis Ababa produces only rifle ammunition and cannot ever cover the demand for this type. As far as is known, there are no factories for the manufacture of artillery ammunition. No information is available as regards the number of tanks or armored cars and airplanes on hand. Yet, it may be advisable to be prepared for surprises with respect to aerial warfare. At any rate, in April, 1934, General Virgen, the former Chief of the Swedish Air Service, and several other Swedish officers were called to Abyssinia. General Virgen is said to serve merely in the capacity of "advisor in matters of general interest," especially in matters dealing with the improvement of the roads and the communications system. In other words, Ethiopia is employing an Air Gen-

eral as a road builder. The airports, which Japan had planned to construct but failed to materialize due to Italian interference, surely were not intended solely for commercial traffic. For, traffic in Ethiopia is not so great as to justify air lines.

Whether the interior organization of the Ethiopian army was changed by the foreign officers (Swedish as well as Belgian) who were entrusted with the training of the men, is not known. Nevertheless, one may be justified in assuming that the standing army now, as during Menelik's reign, is ready to take the field at a few hours' notice. Placed under the direct command of the Emperor and equipped with modern arms, this Regular Army numbers approximately 100,000 professional soldiers. These men are called "Wotates." The Regular Army is distributed throughout the Empire, with the strongest garrisons being established in the newly subjugated provinces of the south. In addition to this force, Ethiopia has at her disposal a great number of soldiers who are following their vocation in civil life, but may be called upon for active service in time of war. These troops carry the name of "Gintiwell" and may be compared with our second line of defense. Whether they are required to participate in maneuvers, is not known. Previously, maneuvers were held only at the threat of war. This militia is not so well equipped and is commanded by the Governors of the various provinces. Finally, there exists a second category of Reserves which, however, is called to the colors only in extreme emergencies. These Regular soldiers are supplemented by native tribesmen armed only with the spear and knife. The various tribes are led by their own chieftains. On the other hand, the primitive armament possessed by these tribes should not cause us to underestimate their fighting value. Familiar with the terrain, both its advantages and disadvantages, the natives are able to secrete themselves about the terrain and thus inflict considerable losses on the enemy. These elements are employed primarily for the purpose of interfering with the hostile lines of communication. The fact that the appearance of this soldiery does not differ from that of the civilian population, renders it especially suitable for such employment.

Whereas, the arms for the Reserve units are stored in government arsenals, several tribes of a high caste, which live near the southern frontier, have the privilege of providing their own arms. Although the rifles are furnished by the

government, they become the property of the bearer. Under certain circumstances, this may result in a reduction of the fighting strength; for, these particular tribes are not very reliable.

The right of maintaining a bodyguard is granted not only the Emperor, but all principal commanders and chiefs as well. This bodyguard is provisioned and sheltered by its respective chieftain. The strength of the bodyguard does not depend alone on the rank, but on the financial condition of the respective chief as well.

On the march, Ethiopian troops are accompanied by an enormous retinue. Each soldier has his arm bearer—a boy from twelve to fifteen years old—and all married men take with them into the field their entire families. In addition there are servants, water bearers and bread bearers. Unless tactics have been changed, the entire force remains concentrated in one bivouac during a halt, thus offering an excellent target for airplanes.

The mobilization is not concluded, however, with the concentration and equipment of the civilian contingents. The Governors of the individual provinces are required to store sufficient food supplies in the depots, which are called "Gottaro," to satisfy the needs of the troops on the march. This is necessary in view of the fact that the districts included in the war zone, wherever they may be, are not in a position, themselves, to provision the army. Moreover, the service of supplies does not always function properly because of difficult road conditions.

While the training and armament of the average Ethiopian warrior, with the exception of the "Wotates," may be lacking in many respects, his soldierly qualities are great. The Abyssinian esteems the profession of arms the only occupation becoming a man. Hence the soldier ranks highly among his fellow countrymen and he, in turn, is zealous in his efforts to be efficient and brave so as to show himself worthy of this respect. He is a soldier from head to foot. Schooled by nature, and thoroughly familiar with the open field, the Ethiopian is very adept in taking advantage of the terrain. Furthermore, he is said to be fearless, moderate in his wants, and enduring. For hours he will push on at the double regardless of the heat of the day, and a short rest will suffice him to gather the necessary strength for enduring

the same exertions the following day. Average marches of 30 to 35 miles are no exceptions. The army possesses far greater mobility than the excessive number of camp followers may lead us to believe. Moreover, the rate of march is astonishing because an actual march discipline barely exists and the condition of the terrain generally permits only the single file march. Despite the fact that the army in general is inadequately armed and trained, its natural fighting strength is considerable. For generations, only the offensive spirit has been developed in the ranks of the Ethiopian army.

In estimating the fighting value of the Ethiopian army, there exists one factor, however, that must not be overlooked. The population does not constitute a racial unity. The real masters of Abyssinia are the Amhars, whose number is estimated at three and one-half millions. Though inhabiting the Plateau in the north, they are represented in every town as officials and soldiers. The south and southwest are populated by the Galla, who number four million. The territory extending to the coast of the Red Sea and the Indian Ocean is settled by the Danakil and their kinsmen, the Somali, who comprise a total of one million. Finally, the region of Lake Rudolf and the adjoining districts of the Galla are inhabited by one and one-half million Negroes. Numerically, the ruling race comprises only one-third of the entire population.

This racial division is further complicated by the religious differences. Whereas the Abyssinians adhere to some primitive form of Christianity, most of the remaining races are Islamites. The mutual dislike of the Christian and the Mohammedan, which is especially apparent in the Orient, is aggravated here by the difference existing between the ruling and subjected tribes. The Abyssinians have failed to gain the friendship of the population of the districts they conquered several decades ago. Not only have the Abyssinians placed the yoke upon the subjugated tribes, but they exploit these people to an extent bordering on slavery. It is this fact which Italy is now using for the purpose of justifying her policy of aggression.

There is no doubt that the efficiency of the army is greatly reduced by this racial and religious difference, and that the reliability of the Galla and Samoli tribes is not assured because of the dictatorial methods employed by the Abyssinians. On the other hand, we should not conclude, off hand, that this

represents an advantage for Italy. For the contrast between Christian and Mohammedan exists also with respect to the Italians. Nor should we forget that the employment of colored troops in the World War as well as the quite active Communist agitation has aroused Africa. The hostility toward Europe is increasing and it may be assumed that the Ethiopian population, even though divided both racially and religiously, will unite for a common struggle against the white powers. This constitutes a considerable threat for Italy. True, the native troops from Eritrea and Somaliland fully showed their mettle during the conquest of Tripoli. However, it is doubtful whether they will prove just as reliable in a conflict against the Ethiopians to whom they are racially bound. At any rate, the native troops were highly unreliable during the campaign of 1896. The revolt led by the allied Ras Sebat and Agos Tafari, with their Abyssinian troops, was a sign for the other natives to mutiny; these insurrections became more and more frequent and were never wholly suppressed. The unreliability of the colored troops is a factor of great importance; for the employment of European troops on the Plateau, where roads and water are scarce, is rendered difficult and necessitates great expenditures and efforts. The smaller the number of colored troops placed in the field, the greater must be that of white troops, and the more difficult will be the supply problem. It is so difficult to supply with the barest needs in matériel and food, European troops that are located far away from their base, between mountains and on narrow roads, that an increase of the combat forces beyond a certain limit is not only useless but dangerous.

The employment of native troops has still further disadvantages. The similarity in appearance of the population residing on either side of the frontiers greatly interfered with the defensive action during the retreat from Adowa. The Italian troops were unable to distinguish friend from foe and had to be extremely careful in selecting their targets. Meanwhile, the Italian native troops have been uniformed, so as to forestall mistakes. This advantage, however, was gained at the cost of their fighting value; for the uniformed natives, despite all camouflage, are far more easily visible in the clear and transparent air than the brown figures of the Ethiopians who can hardly be distinguished from the terrain.

The political entity of Ethiopia is the work of Menelik II but he was able to complete this feat only after engaging in serious conflicts with the native chiefs and governors that had risen in revolt. However, when years of illness prevented Negus Negesti from exercising his rule, it became evident that the ties uniting the various tribes were rather loose. After Menelik's death, conditions gradually became worse and regular civil war ensued in 1916 against the then Emperor Lidj Yassu. True, this revolt was instigated by the Entente Powers because of the Emperor's sympathy for Germany. Nevertheless, this revolt goes to prove that the individual chiefs are not yet resigned to a centralized rule as designed by Menelik. Political friction within Ethiopia has not been reduced to date. Though kept a prisoner by the present Emperor Haile Selassie, Lidj Yassu still has a considerable following in the country; this is due particularly to the fact that Selassie, according to the Abyssinian law of succession, has no legitimate claim to the throne. Besides Yassu, there are still other pretenders to the throne, who base their rights on their relationship with Menelik's predecessor, Emperor John II. This dynastic friction must not be dismissed lightly; for each chieftain and all nobles have at their disposal a considerable military guard. In other words, political ambitions are supported by a certain degree of armed strength. Up to the present, however, the modern history of Abyssinia has always shown that the political differences, which simultaneously represent disputes between the individual chiefs and governors, will disappear at the sight of a common threat. In the past, the various tribes have never failed to rally in defense against foreign attacks aimed at the independence and freedom of their country.

It is extremely difficult, therefore, to gain a true estimate of the fighting strength of Ethiopia. This much is certain, however, a campaign launched against the war-tried Ethiopians even today would be anything but a military excursion. Then, too, the geography of Ethiopia offers considerable natural protection.

The topographic characteristics of the Ethiopian Empire are no more uniform than the racial ones. The Plateau of Habesh respresents a natural fortress and is excellently suited for defensive action; at the foot of this Plateau, there are located in the east the Danakil Basin and in the southeast

the Somali Plateau. These latter regions and the colonies of the European nations situated along the coast form a geographical unit. It will be necessary to cross these regions in order to strike at the heart of Ethiopia. Italy, on the other hand, is at an advantage inasmuch as Italian Eritrea extends well onto the Abyssinian Plateau in the north.

This Plateau serves as a national barrier against an invasion and will cause an aggressor endless difficulties. Wall-like precipices border on the surrounding country with a lower elevation. In the east, the edge of the Plateau is steep and without any passes, and reaches an elevation of 2,700 yards. While, in the south and southeast, the decline likewise is steep, it is less abrupt and less uniform. Here, the valley of the Awash, which prescribes the course of the railroad, permits an entry into the interior without offering excessive difficulties. The western edge of the Plateau is not so uniform in elevation nor so outlined. The numerous rivers, which here flow toward the Nile and its tributaries, have dug a number of natural openings in the mountain wall. It would be a mistake, however, to assume from this that traffic conditions are better in the west than elsewhere. Here, as throughout the country, the valleys constitute deep and abrupt incisions in the terrain. Valleys with a sheer drop of 1,000 yards are no exceptions. Moreover, the course followed by these valleys is very irregular, so that hostile forces may easily be captured should they be able to enter the valleys at all. These canyon-like valleys also render difficult traffic on the Plateau. There are no bridges crossing these valleys, and it is impossible to descend into them without resorting to detours. On the other hand, such topographic features tend to favor enveloping movements and covered approaches to within close proximity of the enemy. This is all the more notable since the Abyssinian is an expert mountain climber and no road is too bad nor any elevation too great for him. Ethiopian troops may, therefore, negotiate precipices that are hardly accessible to European troops.

Above this Plateau, three rises the Ambas, a number of mesas which constitute individual fortresses similar to that formed by the country as a whole. The deeply carved terrain offers a difficult zone of operations. While only a few places and only a limited number of accessible roads require defending, the incisions in the terrain interfere tremendously with

the maintenance of liaison between the forces in the field and greatly obstruct the range of view. This same terrain, however, permits the defending forces, who are familiar with all its hiding places, to reconnoiter and keep well posted on the movements and disposition of the enemy.

The poor vision offered by the terrain is further reduced by the brush-like vegetation. Thorny desert shrub, growing in patches or in large thickets, cover the entire country. These "thorn fortresses" obstruct one's movement as well as one's range of view, while offering the natives welcome hiding places and protection.

The disadvantages of the terrain and its advantages for the defender are best illustrated by an episode of the retreat of Major Toselli from Amba Aladji to Antalo (7-8 December 1895). The withdrawal had to be accomplished over a narrow path, on one side of which there was an abyss 400 yards deep; while on the other side steep rocks rose high in the air. These rocks were occupied by Abyssinians who would fire into the defenseless column from a distance of 50 paces. The Italian detachment, composed of 1800 natives, was practically annihilated. Major Toselli and all other officers were killed.

Finally, the Plateau in its extension possesses a defensive factor which should not be underestimated. While the greatest distance from north to south measures 938 miles, the maximum interval between the foot of the Plateau in the west and in the east measures 325 miles. These distances gain all the more in importance since technical implements are of little avail in this terrain. This applies equally to friend and foe. On account of the size of the country, the Ethiopians may avoid an enemy by evacuating certain districts, without decreasing their defensive power in any way. The vast extent of the territory and the fact that it is thinly populated furthermore permit the Ethiopians to draw an opponent far into the country until he has reached a point where he may be attacked. Both the extent of the terrain and the fact that the Ethiopian troops are familiar with its characteristics, finally favor a demoralizing guerrilla warfare. The size of the country makes it also impossible to subdue Ethiopia by starvation. The frontiers are so long and so difficult to guard that it is simply impracticable for a hostile army, which is bound to remain small, to cover their entire

extent. Regardless of the difficulties, there will always be some hold through which munitions and other matériel may be imported.

Italy by no means underestimates these difficulties. During the frequent meetings of the Supreme Defense Council, the General Staff in February of this year emphasized that it would require 30 years to execute military operations on a large scale and definitely establish peace in the country, that is, to quell the revolts that must be expected.

Massaua, Assab, Djibouti, and Mogadiscio will be the bases for the attack directed against Ethiopia. Djibouti undoubtedly is the most valuable of these points, because it is from here that the only available railroad leads into the interior of the Plateau. France will hardly place this railroad at the disposal of anyone but Abyssinia; for, as we already know, she is greatly interested in maintaining commercial relations with the Empire. Although, since the Treaty of Rome, Italy has gained some influence over this railroad by taking over a number of shares, she may exercise this influence only with the consent of France, owing to the fact that she has no direct access to the railroad.

Another railroad leads toward Ethiopia from Massaua. After passing through Asmara, this road turns northwestward in the direction of Cheren, that is, it moves farther away from the Ethiopian frontier. Communication with Ethiopia is maintained by three automobile roads, two of which emanate from Asmara. Yet these roads end shortly before reaching the frontier.

Italy is planning an automobile road that will lead from Assab to the interior of Abyssinia; the actual construction, however, has as yet not begun. Nevertheless, there are indications that Italy is seriously thinking of improving the roads which connect Italian territory with Ethiopia. At any rate, the Press reports that laborers have been sent to Eritrea and Somaliland for the purpose of constructing roads. Mogadiscio is the final base of operations. A railroad leads from this seaport to Lugh, on the Giuba river. It is not known whether this railroad has been completed. Another lane of communication is the Giuba river which, for several months of the year, is navigable as far as Bardera.

From a topographic point of view, Massaua may be considered the best base of operations because the Plateau

may easily be invaded from that direction. On the other hand, Italian colonization in recent years, had advanced also toward the Abyssinian frontier with the result that the communication system today is far better than the one which Baratieri had at his disposal forty years ago. At the frontier, however, difficulties arise. It is here that the mountains of the Tigre region rise out of the plain and form a chain of frontier guardians that may be hard to overcome. While vast and undulating plains, interspersed by long and flat-backed mountain ranges are the characteristics of the Plateau on the Italian side of the frontier, the gently sloping terrain disappears entirely on the Abyssinian side. Enormous sections of mountain ranges, with jagged and abrupt ridges and with deep and narrow gorges, render movements difficult. To the defender, who is well acquainted with the nature of the country, they offer excellent positions and opportunities to ambush the enemy.

The great difficulties that will have to be surmounted are exemplified by the British punitive expedition directed against Emperor Theodoros II. A distance of 650 kilometers had to be covered in marching from Zula, the point of disembarkation, to the Abyssinian fortress of Magdala. Although this march was accomplished without enemy interference, it nevertheless required the British troops from 2 December 1867, to 7 April of the following year to complete it. It should be noted, however, that this was a case of an advance made through a terrain that was completely unknown, which naturally tended to diminish the rate of advance. Another example of the slow rate of advance, usual in Ethiopia, is furnished by the march undertaken by Baratieri who, in 1896, operated in these same regions. He expected to accomplish the 8-mile night march to the battlefield of Adowa in eight hours. Actually, however, he covered only a distnace of about 1500 yards per hour.

Nor will an advance made from the base of operations Massaua—Asmara strike objectives of strategic importance within a reasonable distance. The holy city of Adowa as well as the old crown city of Gondar, which will be first to obstruct an advance, are no more important than any other town. There is only one objective, the occupation of which will be of decisive importance, namely, the city of Addis Ababa, with its railroad. At first glance, it seems as if this

city may be easily reached from Assab. Not only is this seaport situated nearer the railroad, but there are no mountains to obstruct an advance. And yet, Assab cannot be considered a base of operations; for the road leads through the hot and arid Danakil Desert, which, except by means of an improved road, can hardly be traversed even by a motorized army. Furthermore, the zone of communication along this line will be exposed to harassing attacks of the savage Danakil tribe. An advance staged due west is entirely out of the question; such a movement would founder on the high and steep mountain wall which positively separates the Plateau from the plains.

The assault against the railroad line may be executed from a southerly direction, using Mogadiscio and Lugh as bases of operations. Yet this would require a march of 600 kilometers of arid country, with the movements becoming more and more difficult as the advance progresses toward the north.

Situated far away from the sea and separated from the coast by desert country, the topography and vastness of the Abyssinian Plateau make a fortress which would be difficult to capture. Even though an invader should succeed in reaching the foot of the mountains or even the top of the Plateau, little would be gained. On the contrary, the situation of the invading force would become more and more difficult the farther it moved away from the coast and its ports.

However promising Abyssinia may be from an economic point of view, at present she offers nothing that could tend to facilitate the operations of a European military force. As has been noted above, supplies are stored in the government depots when war is imminent, in order to assure the supply of the army. In other words, the country will be bare of food supplies; while the storing of supplies in a limited number of places will permit of their being destroyed in the event of a withdrawal. Hence the invader must always be prepared to enter a country where he may find no support whatever. Yet, disregarding a destruction of supplies, at present the country is in no position to furnish provisions for anyone but her own population. For this reason, all supplies for an expeditionary force must be shipped from the mother country.

The fact that European armies would be dependent on their mother country for supplies is perhaps Ethiopia's strongest weapon. The least interference with the service of supply will cause repercussions at the front. Thus Baratieri's advance to the battlefield of Adowa was greatly handicapped by the shortage of food supplies, which increased from day to day. These difficulties, on the other hand, could have been avoided far more easily by withdrawing to a safe base where food supplies could have been drawn. Yet a retrograde movement was bound to impair the spirit of Baratieri's forces, and so he decided in favor of the advance. Baratieri believed, by moving nearer to the road: Adowa—Gundet—Asmara, he would improve and protect his communications and thus eliminate the difficulties encountered in providing food supplies.

The Italians were not entirely without blame for the failure of the rearward communications. The service of supply did not function because of its poor organization and because the officers showed little appreciation for this branch of the service. Yet even the best organization cannot surmount the natural and climatic difficulties; it is due to the latter that uninterrupted functioning of the zone of communications cannot be maintained the year round and continuous warfare is impracticable.

In accordance with the monsoon-like change of the air currents, rains recur at regular intervals. The rainy season is sharply divided from the dry season. The former commences in May and lasts until late September, reaching its height during the months of July and August. It is during these months that fifty percent of the entire precipitation takes place. Ordinarily, it rains only during the afternoons; while in July and August it rains also during the night. In those months downpours lasting all day are no exceptions. Generally they are accompanied by heavy thunder storms. Addis Ababa, for instance, has registered as many as 112 thunder storms in the course of 148 days of rain.

The streams cannot always hold the sudden downpours, and floods are a frequent occurrence. Softened by the rains and the waters of the raging streams, the roads become impassable and wide stretches of land are changed into large lakes. Yet, even in sections with sufficient drainage, traffic is blocked by the rain. The rivers in general have no bridges, but in the dry season carry only little water and


Omdurman
Khartum
Bahr
Nile
White
Wad Medani
Gedaref
Sennar
Kosti
Singa
Flat Region of the Blue Nile
Er Roseires
Dunkur
Rahad R.
Blue Nile
Abyad R.
Bahr
EGYPTIAN SUDAN
Kassala
Biscia
Mareb
Asmara
Adi Ugri
Bahr Setit
Setit
Arrow Points to Vast Gorge of River Takkaze
Ras Dashan Elev. 14960
Gallabat
Gondar
Here Towering Mountains, Impassable Valleys Confront Invader
Abu Timbhor
Dambacha
Abbai
Debra Markos
Dense, Swampy Jungle Country
Kirin
Addis Alem
ADDIS ABABA
WALLEGA
Nakamptti
Gambela Post
Gore
Baro R.
Akobo Post
Great Mountainous Land in a Tropical Setting
Akobo
Gila
Omo
Waka
Dalbu
Abera
L. Abaya
Alpine Country Deep Ravines
Chamo
Gardula
Argi
Maji
Gumba
Lotigo Swamp
Elgume
L. Stephanie
Ashabo
Mega
Moyala
(Ft. Harrington)
LAKE RUDOLF
KENYA
Siri
L. Zwai
Shala
L. Awusa
Goba
Biderre
Dawa
Bille
Malca


Physical Map of
ETHIOPIA
(ABYSSINIA)
Capitals
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Buffalo, New York
DAHLACH ARCH.
Fatima Eri
RED SEA
YEMEN
Hodeida
Mocha
ADEN
Aden
Assab
Cululli
Antalo
DANAKIL
Burning Tropical Heat
Sears These Plateaus
FRENCH SOMALILAND
Tadjoura
Djibouti
GULF OF ADEN
Hadele Gubo
Zeila
AUSSA
Lassarat
Awash R.
Bulhar
Berbera
BRITISH SOMALILAND
Dire Dawa
Ankober
Djibouti
Ahmar Mts.
Harar
Jijiga
Hargeisa
Bubassa
Tulli
Mibnil
Daror
Bohotleh
HAUD
Domo
Ft. Dimoot
Kn
Ginir
Raua
Warandab
Ualual
Galadi
Goba
Mogalo
Omein
Gerlogubi
Gabredarre
BALE
Bur Kalane
Sheilaba
Webbe Shebeli R.
Biderre
Livata
Grassy, Scrub Plateau Land
Vast, Arid, Desolate
Waits Invader Here
Hilouen
Ganale
Dorya
Webbe
Bodle
Belet Uen
Malca Murri
Woladeyi
Oddur
Bulo Burti
Dolo
Lugh
Uebi Scebeli
ITALIAN SOMALILAND
Mahaddei Uen
Iscia Baidoa
Damasa
Giuba R. (Jaba)
El Dargula
Mogadiscio

may be waded. During the rainy months, these same rivers change into wild rapids which form an unsurpassable barrier. Hence we may conclude that all traffic stops during July and August and that communication is maintained only under difficulties during the months of May, June and September. In other words, military operations may be carried out only during the period beginning October and ending no later than April. Unless the outcome of the operations has been decided during this period, the foreign forces must withdraw because it will be impossible to bring up the necessary supplies after that time. No matter how many reserves in men and matériel a modern army may carry along, an expeditionary force cannot entirely, or for a long period of time, dispense with its contact with the mother country.

As the excessive water interferes with the operations during the rainy season finally rendering them impracticable, the lack of water during the dry season also has a far-reaching effect. There are no cisterns along the roads, so that the danger of running out of water prevails wherever there is no natural water supply. It was this latter reason which kept the Abyssinians, with their entire army, from following on the heels of the Italian troops and driving them into the Red Sea subsequent to the Battle of Adowa. Menelik, himself, stated that the extreme lack of water, which was bound to become worse during the months preceding the rainy season, prevented him from so doing. Another example due to the lack of water was the capitulation of Fort Makale, under Major Galliano (29 January 1896). This water shortage becomes all the more serious because it will retard the movement of supplies; for the number of pack animals depends on the supply of water available.

Irrespective of the irregularities and difficulties encountered in communicating with the rear, due to climatic conditions, the maintenance of the service of supply will always be a difficult problem. The distances from coast to plateau are considerable; between 500 and 600 kilometers of the route lead the troops through desert-like country. This extremely long march will necessitate not only a corresponding complement of vehicles, but, in view of the lack of intelligence available regarding the enemy's disposition, will require also strong covering detachments.

Let us assume that the distance from the coast to the foot of the plateau may be covered by means of specially constructed motor vehicles. Yet, once the plateau is reached, everything must be carried now, as centuries ago, on the backs of horses, donkeys, mules and camels or on the heads of native carriers. There exist, in addition to the railroad, a few modern roads that must be used by motor vehicles. The majority of these roads are located, however, in the vicinity of Addis Ababa, so that they represent little aid for the military operations of an invader. Whatever other roads exist, they actually are mere caravan paths. The Ethiopian government has done nothing in the way of improving them. Maintenance work is unknown, and these paths are full of rocks, so that pack animals will quickly tire. In many cases the paths wind their way through the thick brush, making it impossible to assume a broad march formation and forcing the columns to march in great depth. This likewise applies to the narrow valleys. Frequently the drop is so steep that the animals loaded down with their packs have to jump across the narrow gorge.

Bridges are scarce. Except the bridge across the Awash, which the natives regard as a world wonder, there is not a single bridge in the entire country strong enough to meet the demands of modern traffic. Most rivers have to be forded; this is safest even where there is a bridge.

In addition to the difficulties of terrain, there are organizational ones. When the British, in 1867, launched a punitive expedition against Theodoros II, they assigned one pack animal for every man and one native carrier for every two men. If pack animals are to be used exclusively, five animals for every four men may be considered a fair estimate. Assuming the load carried on the mule to weigh between 130 and 220 pounds, the number of pack animals and necessary material at first glance seems rather high. Yet, the estimate may be appropriate; for it is not only the front which will have to be supplied, but in view of the complete bareness of the country, the pack trains will have to carry their own forage, provisions, and whatever else they may need, including water. Thus the load actually carried for the combat troops is decreased by the weight of the supplies required for the trains themselves. Indeed, the supplies to be carried for the use of the trains will be considerable, because mobility in this difficult

terrain is slow and travel requires much time. In order not to overburden the animals, trains ordinarily march from four to five hours a day. The rest of the day the animals graze on pasture land.

The great number of mules required by European troops are not only difficult to obtain, but are still more difficult to maintain. Imported from foreign countries, the animals are unaccustomed to the poor quality of the forage, hence are not as strong as they should be. Furthermore, they suffer from the climate, especially from the severe cold of the nights. The thin mountain air affects the animals as it does human beings. Mules imported from Italy, therefore, have shown a high death rate.

The experiences of the Eritrea—Abyssinian campaign proved that, owing to the difficulties encountered by the service of supply, large European armies cannot be maintained in Abyssinia. These experiences should hold true even today, since there has been no change in the underlying courses on which they are based. Hence, European powers must oppose Ethiopia with a numerically inferior force, unless they wish to place in the field a large army of colored troops. While the latter are easier to maintain, they are not dependable.

A war in Abyssinia can be fought successfully only by cutting off the country from all imports, with particular regard to the import of war materials. Inasmuch as the colonial powers begrude each other the possession of Ethiopia, it is hardly probable that they will support the invader by closing the frontiers. Moreover, the munitions industry is anxious to make money. According to recent reports, Sweden —regardless of the attitude of the Great Powers—will permit the shipment of arms to Ethiopia. The invader, therefore, will have to guard the frontiers or intercept the few lanes of communication in existence. The former of these two tasks can be accomplished only by using a large military force; such a force cannot be made available, however, owing to the supply difficulties. The second task is no less difficult to solve. The principal traffic lanes are situated in the center of the country and may be reached only after traversing an enormous expanse of unfavorable terrain. It is for this reason that the air service might play a decisive role in carrying out the mission of intercepting the lanes of communication.

The numerical inferiority of a European expeditionary force has still further disadvantages. The past forty years surely did not go by without some improvements having been made in the equipment and training of the Ethiopian army, though Ethiopia's military force cannot be compared with modern troops. And yet, both are of equal value; for, the European forces will find no opportunity to employ their modern weapons—except airplanes. Notwithstanding their capacity for moving across country, the employment of tanks and armored cars is entirely out of the question. Modern fire arms, with the greatest value in their high rate of fire, cannot be effectively used, because the pack trains will be unable to supply the front quickly enough with the necessary ammunition.

Judging by reports published in the Italian press, the air service is to play a decisive role in an Ethiopian campaign. There is talk of sending to Africa 300 airplanes and 1500 pilots. Mention is made also of the aerial maneuvers of 1934; the principal object of these maneuvers was to observe and combat an enemy widely dispersed over a closed terrain, as well as to carry provisions to advanced detachments. Field Marshal Balbo, the creator of the Italian air fleet, is said to have trained his air squadrons in Libya in carrying on operations and moving supplies in desert country. These maneuvers undoubtedly were held with a view to eventual operations in Abyssinia. Whether the aerial weapon will come up to expectation remains to be seen.

It should be noted that the brush, the shadows cast by the many hills, and the rocks tend completely to hide the soldier on the ground. While airplanes may be effective in direct action, they will just as often be useless. With the exception of the supply trains, airplanes will find few targets behind the front. Bridges cannot be bombed, for the simple reason that there are no bridges; and road intersections are of no value in a country whose inhabitants never have seen real roads. The only object which may be destroyed is the railroad: Addis Ababa—Djibouti. We may add that the Abyssinian soldier is less dependent on a service of supply than his European opponent. Finally, airplanes may destroy buildings. Yet this would have little effect on the morale of the population. Semi-barbarians do not differentiate between combatant and non-combatant. To them, an enemy is an

enemy, regardless of whether the same carries a weapon or not. It is not at all unusual for the Abyssinians to destroy their enemy's towns and thus inflict heavy losses upon them. True, airplane attacks might strike terror into the hearts of the natives. And yet, Ethiopia herself having acquired a small air fleet, the sight of these gigantic birds should no longer be unfamiliar to the Abyssinians.

On the other hand, the importance of the airplane in one respect is considerable and must not be underestimated. The air service may lend valuable assistance to the service of supply. How strong an air service will be needed, and whether it will be practicable to supply the entire expeditionary force by air, are problems that are difficult to foresee. In view of the fact that Ethiopia possesses only few anti-aircraft weapons, the advantage in this respect lies on the side of the European nations. Nevertheless it should be repeated that the topographic character of Ethiopia furnishes this country a protection which defeats modern armament. Ethiopia, therefore, has certain advantages over any European army; and she may rely upon these advantages during her present conflict with Italy.

AIRCRAFT AND COMBAT VEHICLES VERSUS GROUND TROOPS

By Major F. During, Infantry

Effect of Aviation and Combat Vehicles on Ground Troops

At the close of the World War aviation played a relatively important role in combat against ground troops. Its development did not come to a standstill, as all countries, having realized from experience the importance of the new arm, energetically pushed forward its development and improvement.

Ground troops are principally attacked by attack planes and light bombers. In some armies both missions are carried out by the same type of planes which are equipped with machine guns, bombs, chemical agents or incendiary bombs.

A plane can carry 800 to 1,000 pounds of bombs. The most effective bombs against infantry are considered to be

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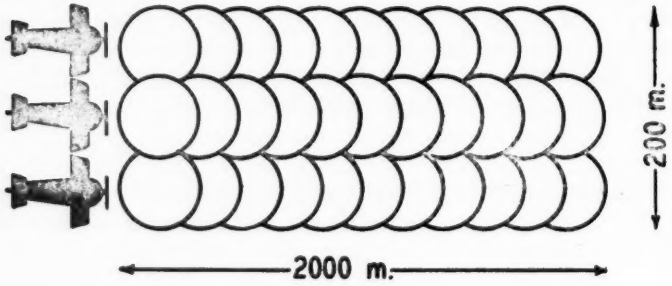
Abstracted from *Voina i Revolutsia*, May-June 1934. Article by I. Tkatchev.

those weighing between 18 and 30 pounds, so that one plane can carry about 40 bombs. Planes are equipped with automatic bomb release devices which enable them to drop bombs at any speed at intervals of 50 yards. One bomb produces about 300 fragments and consequently one plane drops about 12,000 fragments with deadly effect, one flight (3 planes), about 30,000, and one squadron (3 flights) at least 100,000. One plane covers with its bomb fragments an area 2,000 yards in depth, one flight an area of the same depth and 200 yards in width, and a squadron an area of the same width and about 3 miles in depth. On the march one reinforced regiment or one brigade is extended over such a depth. A close column which is exposed to such an attack will naturally suffer heavy casualties. Bombers are a powerful weapon whose effectiveness on ground troops depends to a great extent on surprise.



SKETCH No. 1
Area covered by fragments of 9.5 kg. bombs of one flight of airplanes.

The following example gives an idea of the effectiveness of machine gun fire. As a plane is normally equipped with 4 machine guns, which have a high rate of fire (about 1,000 rounds per minute), it can fire about 5,000 to 6,000 rounds per minute, a flight about 20,000 and a squadron about 50,000. As the average depth of an infantry battalion column is 450 yards, and as the average speed of a plane is 2 miles per minute, it can remain above the column for 10 seconds. During this time the plane can fire about 1,000 rounds, which figure will naturally be reduced if the column is more or less extended. Under favorable conditions a flight during its first attack can fire about 3,000 rounds which may produce relatively heavy casualties.

An airplane can carry 100 gallons of chemical agents and is therefore able to contaminate an area of 1,000 yards in depth and 100 to 150 yards in width.

In addition to aviation, *combat vehicles* and *motor-mechanized* units have also grown in importance. The employment of tanks during the World War was limited and their main weakness was the slow speed. They were principally employed for supporting infantry in breaking through fortified positions. Since that time tanks have undergone a considerable evolution. In a future war tanks improved in every respect will be employed in mass for the execution of numerous and varied missions. In comparison with the World War the speed of tanks has considerably increased and has altered the methods of combat employment. The combat speed of Vickers tanks is 20 miles and that of Christie tanks, 25 miles on tracks and 50 miles on wheels. A tank is now an indispensable weapon of reconnaissance detachments. Tanks may move at the head of columns and immediately engage the enemy by making use of their great maneuverability; they support infantry attacks and due to their speed can rapidly penetrate into the depth of the enemy position and neutralize his activities. In mechanized units tanks with heavy fire-power are employed. On an open front or flank a tank attack may always be expected, while on an organized position hostile penetrations and attacks of mechanized units may take place. In any case preparations should be made for antitank defense.

As aviation is nowadays the most serious menace to ground troops on the march, provision should be made first for antiaircraft defense and second, for antitank defense but in such a manner that the unit can repel an enemy who attacks simultaneously from the air and with ground troops.

Organization of Antiaircraft Defense on the March

Active antiaircraft defensive weapons are antiaircraft artillery, antiaircraft machine guns, and organized machine gun and rifle fire. These weapons afford partial protection against air attacks if they exist in sufficient numbers, are of good design and are skillfully employed. Particular attention should be paid to the selection and training of riflemen who should be intelligent soldiers who do not lose their heads and who quickly react to any changes in the situation. Experience has shown that rifle fire is effective against low flying

planes; it is necessary to employ armor-piercing bullets, to determine correctly the aim and sight, to assign the target and to organize fire; all of which can be achieved only through careful training and long experience.

However, all these weapons are intended for the direct protection of columns and cannot carry out antiaircraft defense elsewhere (with the exception of a part of the antiaircraft guns); they are incapable of repelling an air attack but enter principally into action at the moment when the column is attacked. Moreover, they are never attached in such numbers as to cover the troops both on the march and during the passage over dangerous areas, therefore on the march such passive antiaircraft defense methods must be also employed which give the greatest possible security.

Every commander should take care that a unit arriving at its destination should not only be fresh but also protected against casualties resulting from air attacks. The passive methods of antiaircraft defense are: (1) cover through darkness, (2) camouflage, and (3) extension of columns.

Some time ago darkness was regarded as the best cover against air attacks. Now this view has changed as in recent times the activities of aviation have been developed to such an extent that air attacks by night are also possible. Nevertheless darkness facilitates camouflage and affords sufficient protection during movement if auxiliary means are employed: avoidance of the principal objectives of hostile reconnaissance and of main roads, movement along secondary roads and in extended order.

The object of camouflage is to conceal the movement from air observation to such an extent as to reduce perceptibly the danger of attacks.

Of the passive methods of antiaircraft defense darkness and camouflage afford effective protection only in case they are combined with an extension of the columns.

The extension of columns on the march is generally practiced in the Red Army. The Soviet author believes, however, that a further extension is necessary not only into depth but also in width. A division extended in depth and moving along one road forms a column of 10 to 12 miles; this figure is reduced to 6 to 7 miles if the movement is made on two roads. It was previously shown that even a battalion column

offers a good target for air attacks, especially if the troops, although extended into depth, march along the same road.

In summary, it may be said that both the active and passive means of antiaircraft defense do not afford complete protection from air attacks; they merely alleviate the situation to a certain extent. Auxiliary methods are required which reduce the casualties. *The governing principle is the special extension of battalion columns at the moment of a direct menace.*

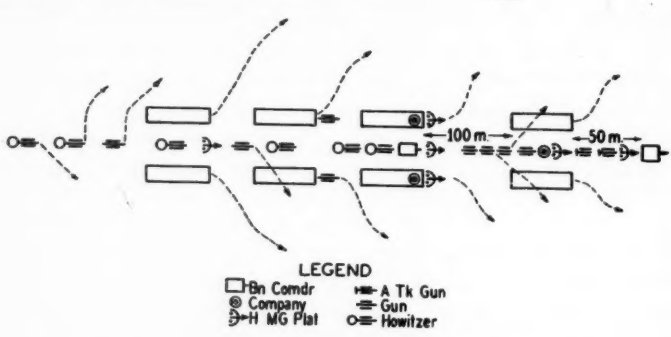
During the whole march a battalion column cannot be divided into smaller columns as this would render difficult combat when encountering the enemy and complicate the march. On the other hand, a unit deployed into battalion columns has no [command or liaison] difficulties in a meeting engagement. The battalion is only extended at the moment of danger and resumes its old formation as soon as the danger has passed. This is the governing principle of the system which by no means prevents the extension of the battalion into companies marching along two roads at certain intervals and road spaces. The division into still smaller columns should be practised in order to pass dangerous areas. A brief description of the system is given below:

In order to reduce the danger from bomb fragments the column should be extended before the moment of attack into small groups over an area larger than that covered by the fragments. As the extension should be greater in width than in depth, the column should be extended in width to at least 750 yards. In such formation over half the troops are outside the danger zone, while those inside it have better possibilities of utilizing cover. Dropping bombs under such conditions is useless. If signal communications are available the troops should be warned three minutes before the appearance of aircraft. For this purpose it is necessary to organize in divisions or separate regiments a circular net of air intelligence posts, each of which consists of two specially trained men. These posts are stationed only after a careful study of the map. The sectors to be observed are determined in accordance with possible threats (possible contaminated areas, probable routes of approach of mechanized units and aircraft, etc.). Only two signals should be transmitted, one when single planes have appeared and the other when groups of planes are visible; these signals are the same for the whole division. A regiment details personnel for 4 to 5 posts and

in a battalion column 5 to 6 men are designated to watch continually the observers and simultaneously regulate the movement. A sketch of the observation posts is sent to all officers down to battalion commanders. At halts a battalion staff officer examines the air sentinels in order to determine whether they are familiar with the direction and location of the observation posts. These sentinels always have a rocket in readiness for giving signals.

It is possible to extend in two minutes. The experience of exercises has shown that not only a battalion column but also a regimental and even divisional column moving along one road can extend within the prescribed time. Of course, this is only feasible if a certain system of extension has been thoroughly studied and if the units have been well trained. First it is necessary to eliminate the interval between the danger signal and that ordering the extension. The latter signal can be given by any medium commander [company officer] or battalion observer. It is only necessary that the unit be trained in time in the extension method.

The extension may take place from the ordinary formation of a column. The Soviet author recommends, however, deploying the formation outlined in Sketch No. 2 in order to facilitate movement and extension.

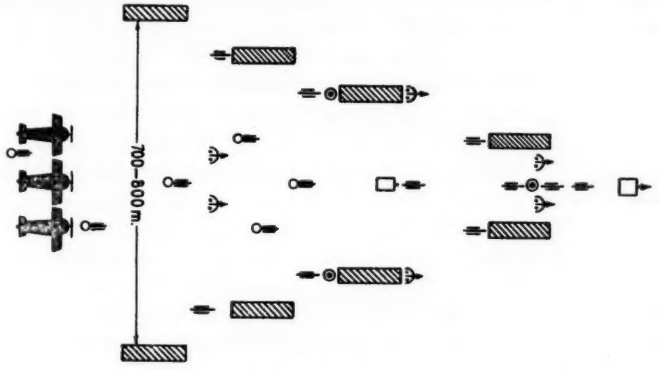


SKETCH No. 2

Organization of column on the march and order of extension. Composition of column: 1 battalion, 6 howitzers, 6 guns and 4 antitank guns.

The infantry, with the exception of the point of the advance guard, marches along the sides of the road or outside it. This method should be the rule. Some authors

believe that this fatigues the combatants. In reality the opposite is frequently the case; in the summer when the roads are dusty, movement along the sides of the road or outside it is perceptibly easier, all the more so in the winter when the soldiers march on skis. The advance guard extends on both sides of the road to a distance not exceeding 150 to 170 yards and leaving one platoon with 1 or 2 guns and the heavy machine gun platoon by the roadside. If an encounter with the enemy is possible, the support of the advance guard should be assigned a heavy machine gun platoon and, if possible, a gun [cannon]; the remaining companies of the advance guard follow at a distance of 100 yards. As companies extend only on one side of the road, they march on this side. The company marches in a column of twos, keeping a distance of 20 to 25 yards between the platoons. The road is reserved for vehicles. The heavy machine gun company is distributed among the companies. The guns move on the road at a distance of about 75 yards between pieces. The artillery also extends along the front; the regimental artillery and battalion cannon are distributed among the companies. An extended column is shown on Sketch No. 3.



SKETCH No. 3

Battalion column extended in platoon formation.

A battalion column is extended as a rule into platoon columns. An extension of platoons into sections may be ordered by the platoon commander; after the danger has passed the sections close up again and continue movement.

Discussions have arisen as to whether the column should continue movement or halt during an attack by airplanes.

If the column is extended during the attack, only those persons halt who are directly threatened and take cover but this should not stop the movement of the whole column. After the danger is over the platoons or sections which have halted continue their march immediately. Halts will last only a few seconds. Even platoons, if their numbers are physically well trained, can run about 350 to 400 yards in two minutes; consequently extension will take place over a distance of 700 to 750 yards in width. If it is necessary to frequently extend this figure naturally will be lower; in this case the order of the platoons in a company should be changed after the first extension. Physical training in preparation for extended order should be carried out every day when going to or coming from exercises. The closing up of columns also requires training. If it takes 2 to 3 minutes to extend, closing up requires 8 to 10 minutes; the governing factor is training. In order to close up short halts are made.

One of the most important advantages of extending is that the units are entirely freed from that feeling of helplessness and confusion which is usually manifest when troops are attacked by aircraft. The men know what to do and are convinced that danger and casualties can be avoided.

A brief review is given below of the most important points:

(1) *Signalling.*—Columns are equipped with either whistles or horns which are of the same type in the whole division or regiment. The best means of communication with observation posts are simple radio sets.

(2) *March discipline should be high.*—Commanders should not be permitted to leave their columns and groups should not be formed during halts. Commanders must remain with their units and carry out the prescribed orders with respect to road spaces, signals, rapid and accurate execution of orders, etc.

(3) *Antiaircraft defense weapons.*—As extended columns do not require many antiaircraft weapons, they may be employed principally for the protection of defiles and bridges. Properly trained infantry sections intended for antiaircraft defense remain by the roadside. Riflemen are extended in depth and their fire is concentrated. They also give some antiaircraft protection to the artillery near the road.

(4) *Passage of defiles if no detours are available.*—Defiles should be passed at a double time, vehicles and troopers at a trot or even at the gallop. Concentrations at either end of a defile are strictly prohibited. In particularly dangerous defiles which have to be passed by large forces, special commands should be posted to prevent concentrations.

(5) *Rear guards*, up to and including battalions, march in the column deployed in depth. If the column is extended the rear guard may also be extended and move in squads or groups of 3 to 4 vehicles beside the road at distances of about 200 to 300 yards. As soon as the danger is over the vehicles concentrate on the road and continue movement in the old formation. Rear guards of divisions and regiments move in independent [separate] columns. Units extend only during the passage over dangerous areas; movement along side routes is the rule.

(7) *The rate of march* of an extended column is not reduced as has been shown by exercises. On marches of 12 miles the average distance covered per hour was 3 miles and units were extended two to three times.

(8) *Division and regimental columns compelled to move along one road are echeloned in depth.* Road spaces between battalions are up to 1,000 yards, between regiments up to 1 mile.

ORGANIZATION OF ANTIGAS DEFENSE ON THE MARCH

Antigas defense consists of reducing casualties from gas attacks, moving troops out of contaminated areas and eliminating any chemical agents on roads which cannot be passed by circuitous routes.

Gas signals are the same as antiaircraft defense signals. All soldiers remaining on the road put on their gas masks, while those deploying do so after they have begun to walk again. The noise of the airplane engine is the gas signal for a column which has not had time to deploy. Contaminated areas are usually avoided; if impossible, degassing should be carried out as quickly as possible. For this purpose reserves of chemical personnel should be at the disposal of regimental and even battalion commanders.

ORGANIZATION OF ANTITANK DEFENSE ON THE MARCH

The extension of a column does not hamper antitank defense; on the contrary, the defense is facilitated if weapons

are properly distributed. In antitank defense every effort should be made by reconnaissance and security detachments to prevent the enemy from making a surprise attack with combat vehicles against a moving column; but if an attack is made it should be repelled. The principal error made in this respect [by the Soviets] is that no reserve reconnaissance organs are left in the column; its commander should always have such a reserve, especially of fast moving [combat] vehicles. This is especially necessary in case the column is compelled to change its route or if the route has become dangerous. In both cases reconnaissance detachments should be pushed forward. The best reconnaissance means are aircraft which are assigned even to regiments moving independently or on the flanks. The distance to be reconnoitered is inconsiderable —about 25 miles, and in particularly important directions not more than 35 miles.

On the march security units are reinforced by antitank weapons so that they can offer resistance to one company of combat vehicles. For this purpose 6 to 8 pieces are required in order to organize a semi-circular or circular zone of protection. As reconnaissance and security units are not strong enough to hinder the penetration of combat vehicles, columns should be assigned antitank weapons. These weapons and the regimental artillery and battalion cannon are distributed among the columns and, to a certain extent, for the reinforcement of the advance guard. Likewise the attached division artillery is distributed among the echelons but the guns form the reserve of the regimental commander. The reserve of a division commander consists principally of tank units. In addition to antitank weapons, infantry also participates in antitank defense employing the grenade projector sections. During an attack by tanks the antitank weapons occupy suitable positions; the grenade projector sections remain in place or concentrate in the threatened direction, while the remaining infantry units retire under the support of the antitank weapons, taking cover and building obstacles against a farther advance of tanks.

The systems of antitank and antigas defense are based on extension, which is also the underlying principle of antiaircraft defense. Extension should also be carried out in the case of cavalry and mechanized units.

MOTORIZATION OF LARGE UNITS

By Major F. During, Infantry

For some time past the press has been urging the organization of large units making an extensive use of the mechanical factor under various forms. Numerous articles were published on this subject in *La France Militaire, L'Echo de Paris, L'Action Francaise,* etc. Some writers believe that the organization of such units will compensate for delays in mobilization and for numerical inferiority by rapidity of maneuver. Thus they believe that warfare of movement can be assured and that the continuous fronts against which all frontal attacks failed in 1918, even after an initial surprise rupture, can be avoided. However, the motorized unit is often inadequately defined and as a result the operations conducted are contradictory. It seems indispensable to clarify these conceptions by establishing first of all a terminology.

The author then discusses generally, the organization, limitations in employment, differences in speed, and different combat tactics of the following:

(1) Partly motorized divisions.
(2) Entirely motorized divisions.
(3) Armored and mechanized divisions.

(1) Partly Motorized Divisions

The regulations at present in force call "motorized units" those in which the motor replaces the horse—for purposes of speed or facility of employment—in a small number of special units, such as reconnaissance, liaison or communication detachments, combat or regimental trains, subsistence or ammunition supply units. These units, moreover, travel exclusively by road and the total number of motorized vehicles is limited. The infantry advances and fights on foot; the artillery is horse-drawn. Tactics remain the same as with the 1918 division. In all divisions the organization can thus be improved without the command being altered.

All the powerful armament of the infantry, accompanying weapons, automatic cannon of 20-mm. to 37-mm. caliber, light antitank and antiaircraft guns, eventually powerful light artillery mortars of 120-mm. to 150-mm. caliber for

Abstracted from *La France Militaire,* 30 April, 2 and 4 May 1935. Article by General Culmann, Retired.

reinforcement, even bomb-throwing weapons and heavy machine guns should be towed by low cross-country tractors, armored or not, replacing the horses or mules which are too vulnerable in the combat zone. Breaking down the weapons into several loads in order that men can carry them, which is a slow and impractical process, is thus avoided. Corresponding supply columns will also be motorized and therefore will be able to render better service. But the motorization of these various weapons will not change either the distances to be travelled, nor the general conditions for deployment, nor combat tactics. The advantage obtained will consist of easier and quicker employment on the battlefield and in an increase in fire-power.

It is believed that divisions as at present constituted are going to be progressively improved by going through the above process. In any case, whether motorized or not, divisions are interchangeable; their coexistence in the army offers no great inconvenience.

(2) Entirely Motorized Divisions

In "entirely motorized divisions," the infantry is carried in trucks and the artillery is tractor-drawn, or exceptionally it is towed on trailers or portée. Some elements for command, reconnaissance, communications, are equipped with cross-country vehicles, the same as in the motorized division. Also, powerful infantry armament is towed by caterpillar tractors.

Due to the general employment of the motor, the speed on roads increases 10 to 12 miles an hour, and the daily distances traveled, from 12 to 65 or even 150 miles. But the infantry still fights on foot. Taking into account the time it takes to entruck, detruck and reach the battlefield, its transportation in trucks would only be advantageous if the distance exceeded 35 miles.

The above figures—150 miles in 24 hours and 35 miles minimum—show that the automobile division can only be employed for strategical maneuver on wide fronts. It is a unit for special use to be held in reserve by the high command.

An attempt at such an organization was made during the last years of the war. Some divisions held temporarily as general reserve were thus able to be transported rapidly, protected by the continuous front. However, only the infantry came in trucks; the horse-drawn divisional artillery only

reached the position two or three days later. It was replaced temporarily by portée artillery but under unsatisfactory conditions, due to the conditions of employment of this type of artillery. This temporary disorganization of the cavalry division will be avoided with the entirely motorized division.

On the battlefield, the infantry of the motorized division retains the same possibilities as before; it cannot, of course, entruck to make a further bound forward following a breakthrough. However, the artillery, if towed by cross-country tractors or mounted on cross-country trailers, will be able to lend continuous support to its infantry. The "disconnection of 1918," between the infantry which advances and the artillery which can only follow with difficulty after a certain delay, no longer exists and it is hoped that the adversary, once repelled, will not be able to close the breach made in his front. It will thus be possible to enlarge the opening. But these advantages will be due to the motorization of the artillery and supply trains, not to new employment of the infantry.

The "German motorized division," briefly described by General de Cugnac in *La France Militaire* of 14 March 1934, seems to be of the type described above. It should be noted that it organically possesses the strength of a battalion of tanks (30 tanks), which increases its power for penetration. It numbers about 3,000 vehicles in the combat echelon and 3,400 with the parks and convoys. Its length in a single column would be 62 to 75 miles, that is, five times that of the ordinary division.

All organizations entirely composed of mechanized vehicles are extremely cumbersome; the German "motorized division" presents in this regard a striking example; its combat echelon numbers about 3,000 vehicles which formed into a column would have a length of about 62 miles.

Consequently, on the march the motorized division is divided; its points for entrucking and detrucking are therefore multiplied. Due to this, the danger is lessened, and this advantage is today essential. As a matter of fact, the continuous fronts which previously sheltered advances, will probably exist no longer. Special units for reconnaissance and protection have therefore become indispensable and their handling will be all the more difficult in that the speed of the advance will be greater.

On the other hand, the menace in the air has increased greatly; it is only necessary to recall that the large German combat airplane is armed with one or two automatic guns of 20-mm. caliber, four to six machine guns, and carries ten bombs of 100 to 200 pounds. The cooperation of the aviation is therefore indispensable to the motorized division and mastery in the air must be obtained.

Detrucking operations, even when carried out at night, run the risk of being taken under the fire of the long range guns of the enemy who will be able to determine where they are being carried out by means of his airplanes sending slow burning rockets with extensive lighting power.

Cloudy weather, mist or a dark night will of course facilitate operations. Nevertheless their execution remains difficult.

In the domain of the organization of the army, the adoption of the motorized division raises an important question: should these units be organized once and for all; in other words, should there be two kinds of divisions—the entirely motorized division, and the partly motorized division as stated under (1)?

To answer this question, the author states that war has always caused special units (the existence of which was not absolutely justified), to disappear. Several examples have shown how a special employment of the former German Imperial Guard proved difficult and embarrassing. During the last conflict, the battalions of foot chasseurs were formed into regiments; the classification into army corps for attack and by sector was not maintained in the French army; it was retained in the German army and limited the amplitude and duration of certain offensive operations.

Of course it is possible that for the initial deployment of the French armies in view of a "battle of the frontiers," for which plans have already been made, normal divisions be deployed in first line and motorized divisions placed in general reserve. For instance, on the right of the French armies a normal division could be near Belfort, two normal divisions on the Rhine and a motorized division in reserve near Epinal. But if the Germans, neglecting Switzerland and the Rhine, made their principal effort west of the large natural obstacles which bar the frontier (the Rhine, the Vosges, the Moselle) and carried their attack against Briey between Metz and Sedan, the French would have to reverse their

plans for concentration; the motorized division in the direction of Epinal could reach the menaced front in two days, where it could be placed in first line. Of course, in that case, the fact that the three divisions on the Rhine and at Belfort were not motorized would be deplorable. Only the development of operations will permit the designations of the large units which should be placed in general reserve.

It is therefore rational to have, not special motorized divisions but transportation units including trucks for the infantry, tractors for the artillery, all batteries of which will be equipped with cross-country trailers, as well as special units for reconnaissance in order that each division may become motorized if need be.

As regards regiments for general artillery reserve, they will all be drawn by tractors, the less heavy guns (73, 105 L, 155 C) being on cross-country trailers.

(3) Armored and Mechanized Divisions

The origin of the armored division on cross-country vehicles can be traced to General Buat, Major General of the French Armies, who in 1918 wrote in an official report as follows:

> ". . . Owing to the formidable effect of enemy fire, the battlefield in a more or less distant future will not see a single soldier fighting in the open; there will come a time when the combat group reduced in accordance will be enclosed in a protective and mobile armor grouped around its automatic arm."

In July 1919, in another report, General Buat referred to the same idea:

> ". . . Of the two tactical elements, only one, fire, has up to now profited by the progress made in mechanization; it has profited by it so much that all movement has disappeared or nearly disappeared in battle. The horse was completely eliminated and the combatant in trenches was only able to move after all the organs of fire of the enemy had been destroyed or put out of action. The appearance of the motor on the battlefield gives back to movement all the importance which it had.
>
> ". . . The Line Infantry Company would probably be a tank company which does not mean to say that

infantry would not exist. . . . The automatic arm to kill man would be replaced by an automatic arm to destroy tanks."

Moreover two types of tanks were advocated for instituting a new arm, or at least a subdivision of the infantry:

(1) Medium tanks to fight with the infantry, armed with powerful machine guns or automatic guns of small caliber, capable of perforating at a distance of 100 yards, armor 30-mm. thick.

(2) Heavy tanks for opening a way for the infantry and the medium tanks, armed with guns of medium caliber for flat trajectory fire, or mortars capable of engaging in a fight against enemy tanks.

The heavy cost of these weapons on the one hand, and on the other, the rapid evolution of technique, prohibit equipping all infantry with tanks. Moreover, the possibilities of tanks, in connection with which speed was not even envisaged 15 years ago, lead us to entirely new combat tactics.

The solution of the problem already set forth in 1918 and 1919 would appear to consist in a limited number of special, homogeneous units, organized in such a manner as to take care of their own needs, not for carrying out raids outside of the battle area but to take part in battle when and where needed, in accordance with the tactics for the special employment of this arm.

Armored divisions in cross-country vehicles do not yet exist in any army, according to the author, and their organization and armament have not yet been determined in a definite manner. This indefinite status therefore allows the boldest conceptions to be made.

In spite of the difficulty which the study of so new a subject presents, and the absence of any experience during the war, the author defines these large units and their conditions of employment.

The main object of the armored division is to reestablish movement on the battlefield. It should therefore be able to overcome hostile defensive fires, almost exclusively caused by automatic arms of the infantry and rapid fire light artillery. All the ruptures made in the front during the last war were defended by means of the machine guns and 75-mm. guns; at Verdun, German assaults were broken by barrages

made with the latter without even the aid of trenches or barbed wire.

The armored division must therefore be able to destroy automatic arms and field guns. For this purpose it must be equipped with machine guns, automatic guns of small caliber—the explosive shell of which will perforate armor and put the personnel out of action—guns and a few mortars, as had been anticipated for tasks in 1919. Owing to the speed of modern tanks and in order to obtain the maximum material and moral effect, great firing speed is required. It should be noted that there already exist guns of 20-mm. to 25-mm., firing 200 rounds and more a minute, and 37-mm. guns firing 100 rounds. A Belgian military writer believes that the large armored division will have about 600 machine guns, 400 guns of small caliber and 150 guns of medium caliber.

Tanks must be protected against enemy armament. An armor 30-mm. thick can offer resistance to perforating bullets fired by rifles and machine guns and even to automatic guns of 20-mm. to 25-mm. Against field guns, a much thicker armor, of 50-mm. to 60-mm. for example, is indispensable.

Moreover it is necessary to have command tanks, equipped with radio, as well as tanks for emitting smoke clouds or artificial fog to hide the approach of large units and eventually to cover their retreat.

Not being able to see clearly and being engaged but for brief action, the entry of the armored division into action must be judiciously chosen as it cannot very well be stopped once it has started. Therefore the commander of an armored division should be in an airplane, or better still in an autogiro, and he should give his orders by radio. In order that one may be able to observe and direct without being hindered by enemy aviation, one must have mastery in the air.

The armored division should therefore operate in liaison with the aviation and the attack it launches should receive the supporting fire of combat aviation at low altitude. A terrible avalanche of projectiles will thus fall suddenly and violently upon the enemy.

The munition supply which can be taken aboard a tank or an airplane is extremely limited. For a combat airplane, for example, the estimated supply is 60 projectiles for an automatic gun of 20-mm. which number is very small. There-

fore the fire delivered by the armored division and by aviation will not last long. It cannot be renewed, as its replenishment would stop the operations for several hours.

To this first cause of weakness is added a second, which is very important. The armored division is incapable of retaining by itself the position it has gained. If it remained immobile, it would be destroyed. Consequently it must be followed immediately by infantry reinforcements brought by cross-country vehicles, and by field artillery on cross-country trailers. While the infantry is in vehicles, it is very vulnerable; if it is detrucked prematurely, it runs the risk of arriving too late. Therefore the liaison between the armored division and its reinforcements must be very well assured. A dislocation, due to an error or caused by enemy fire, will have serious consequences.

Lastly, the effect of surprise cannot be counted upon as the motors will be heard at a distance of 5 or 6 miles in calm weather, due to the use of ground apparatus which can easily be constructed. Warned a quarter of an hour or half an hour beforehand, the enemy will have time to organize his defense, even if his aviation is powerless.

These various considerations lead to the following conclusions:

Incapable of prolonged effort, the armored division is principally apt to operate against an enemy whose means of resistance are weak and whose morale is low.

Such will be the case:

(1) When the enemy front is occupied by forces in small numbers. A line of defense extending over large fronts may occur; for example, during initial covering operations, or, during operations, in the intervals left between two neighboring armies in order to give them facility of maneuver, or on a weakly defended front, etc.

(2) When a front is being formed.

(3) When the enemy is retreating. It is very probable that the use of an armored division would have changed into disaster the defeat of the Italians at Caporetto in 1917, of the British Fifth Army in the Artois, and of the French Sixth Army at Chemin des Dames.

(4) When a frontal or flank counterattack is launched against an enemy who has penetrated the friendly position.

But the conditions would be different in the case of an enemy occupying the terrain in large numbers, having either defensive or offensive missions. Of course the armored division will be able to cross the line of outposts; it will not be stopped but only partially dislocated by the permanent antitank guns hidden in the folds of the terrain on the advanced position of resistance. But afterwards, when it comes in contact with the artillery, which numbers 12 or 14 batteries per 1,000 yards in the defensive and double that number in the offensive, and which are echeloned on a depth of several miles, it will be destroyed by fire and the remainder will have to retreat in a hurry in diverging directions under a smoke screen.

If it delivers an attack against a permanent fortification which has been occupied in time and is equipped with sheltered antitank guns which are fairly powerful, it will undergo serious losses. It will be able to cross a line of small concrete shelters. But in either case it will not have the moral advantage which its armor gives it in the field, when opposed to unsheltered troops; its reinforcements will not be able to pass and its tanks will be isolated.

Thus concrete fortifications, permament or improvised, constitute a serious obstacle which the armored division must avoid.

Other obstacles will stop it; for instance, streams and large forests.

Hence, important possibilities for the defensive organization of the frontiers.

In all the preceding observations it has been considered that the defense was only equipped with fixed antitank armament, and this has little effect against rapid tanks.

New weapons capable of opposing resistance to the armored division before it has reached our positions must therefore be found. Among the various kinds of tanks, the heavy tanks are the most dangerous as they open the way for others. It is therefore necessary to have a gun mounted on a rapid automotive mount which will be powerful enough to perforate armor on which the 75-mm. shell fired at an initial velocity of 550 yards and weighing approximately 12 pounds has no effect. This brings us to envisage the adoption of 85-mm. to 95-mm. guns firing at an initial velocity of 700 yards. This question should be given immediate consideration.

It is seen that the armored division is above all an instrument for exploitation, but its use presents difficulties.

It does not replace the cavalry division which can effect reconnaissances, establish contact and a line of fire, the density of which is equivalent to that of the infantry division, and which is not bound to the road.

The employment of the former is more indicated at the end of a battle; that of the infantry division at the start.

It would be an error to suppress all cavalry divisions to transform them into armored divisions.

THE MODERN GENGHIS KHAN

By Major G.J. Braun, Infantry

Recent literature on the trend of world events visualizes in the offing the spectre of the Mongolian emperors. It fears that this time the Asiatic hordes, equipped with most modern armament and using modern combat methods will attempt to overrun the European countries and deliver the death blow to western civilization. The probability or improbability of such an event occurring in the near or distant future is debatable. Writers differ in opinion; for example, Oswald Spengler believes in the "Yellow Peril," whereas Johann von Seers considers it absurd. As soldiers it is best to limit our views of this Utopia to the tactical and technical aspects.

The birthplace of a new Genghis Khan of our fantasy may be in Japan, China, on the steppes of Mongolia or the land of the Tartars, on the banks of the Volga. The military knowledge we can receive today in the military academies of Tokio, Nanking or Moscow.

The question immediately arises, "What will he learn at these institutions?"

Isserson, the Russian instructor of tactics in Moscow, has arrived at the following conclusion.

Lessons From the World War

The 1914-1918 combat system of the World War was a failure as demonstrated by its inability to solve the problem of breaking through the fronts in position warfare because it exhausted the attacker more than the defender. Even in

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1918 the Germans were unable to change the tactical penetration in one of their operations though it was apparent that it was useless to crash down a door when there is no one behind it. Likewise, when the German front was on the verge of collapse it required 4 months for the Allies to drive the German troops back 62 miles. The leaders of both sides were incapable of solving this new problem of combat leadership.

The idea of the line strategy was based on widening the front and in this manner encircling the enemy and to avoid a true frontal attack. When the freedom of mobility was lost at the end of 1914, the idea of line strategy was lost. Count von Schlieffen never anticipated this situation. Not until then did the Germans endeavor to carry out his war plan of outflanking. Since the fronts overlapped in France and the line strategy had reached the limit of its art, there remained no solution except the breakthrough.

The Russian, Isserson, states the foregoing are the vital strategical lessons learned from the World War.

The New Combat Method

In future wars there will be a fundamental change in the character of operations, especially in the nature of depth. The unusual growth in combat methods in depth must be reckoned with. Depths in modern operations, including the reserves, will reach 37 to 62 miles. Should the defense, upon warning, assume a similar depth, he will naturally echelon in fortified zones which, thanks to motorization, can rapidly be supplied with fresh reserves. It can readily be seen that the attacker will be compelled to overcome this organization in depth by a series of unbroken combat operations. It is impossible to conceive modern operations as one-act affairs conducted in confined sectors.

We now stand on the verge of a new era in combat leading which compels a shift from the line strategy to the depth strategy.

The strength of the hostile defense first reaches its zenith when the attacker is fairly close to his objective and the defender is compelled to disclose his hand to retain his position. In this situation the attacker is led to believe that the greatest difficulties had been surmounted and that the remaining action would provide easy going. This is where

the great error exists. The greatest effort of all arms can always be expected at the end of the operation, and the skill in leadership in this type of operation lies in recognizing and anticipating this period in the attack and keeping all available forces prepared to step in when required. This knowledge will necessitate a new combat organization of units of the attacker.

It is necessary that there be an accumulation of assaulting forces in depth which should increase until the final victory is assured. The modern attack can be compared to a series of waves which continue with ever increasing strength from the depth in the rear area to overcome the obstacles placed before them. It would be erroneous to expound this theory if this piecemeal use of the military forces were preached. During the initial operations of a war, all available forces must be used. The economy of this lies in the mobilization of comparatively strong new forces to be prepared when the critical moment arrives to be thrown into the conflict to assure victory. The objective is the continuous acceleration of effort in the operations to break down the enemy's resistance throughout his entire depth. The operative echelons of the mobile army constitute the first strategic echelon behind which the strategic echelons of the reserves are formed. Each theory concerning minor service branches of the army must be discounted.

Without question a serviceable massed aviation force will participate as the advanced combat echelon of the first strategic echelon. As second advanced echelon, following the aviation forces, there would be the tanks and armored cars and motorized cavalry whose mission would be to delay, disrupt and harass the hostile advance and to occupy and deny him vital terrain features in his advance. The third and fourth echelons are made up of the large infantry unit: armies, corps and divisions.

As soon as the foregoing units move out the second strategic echelon will be organized in the interior of the country, also the mobilization of the second line.

The attack is most powerful. Today modern combat equipment, without question, possesses superiority over the fire-power of a defense.

Its quantative massed entry is a self-evident step toward the success of the attack. Combined with this principle the

massed use of large aviation units in the air for the attack is just as important as the massed use of great fire-power on the ground. The problem of superiority of attack material will principally be solved by the mobility of the same. The entire development of modern military technique indicates the increasing and fulfillment of mobility. Aviation and armored vehicles constitute the greatest means of this mobile warfare. The development of the modern type of fortifications is an indication of the great concern which European general staffs consider this superiority of attack equipment. On the eastern border of France, these defensive fortifications have assumed the character of an unbroken line of reinforced concrete fortresses whose approaches are protected by electrically operated mine fields. The overcoming of this concrete and steel girdle without modern means is without doubt impossible. Should there be a development in the art of fortifications construction of a rapidly hardening cement whereby it would be possible to construct reinforced concrete fortifications in the course of mobile warfare, then the art of war can anticipate new problems in position warfare which man has never before anticipated. On the eastern European theater there are no indications of this type of position warfare and here the superiority of modern attack weapons does exist.

The New Russian Approach March

The 496-mile Russo-Polish frontier is schematically divided into sectors of 6 to 8 miles frontage to each Russian division. When the Russian advance from east to west reaches the Vistula—San Rivers the sectors will be but 3½ to 4½ miles wide per division. Actually the Russian west front will not be without gaps. It is desired that gaps do exist as tactical outlets on the Western Russian theater. Also operative flanks are desirable to enable the modern mobile forces to utilize them. The Russian strategical assumptions are greatly similar to those existing on the Franco-German front at the beginning of the World War when the German Army still had the opportunity to advance with its right wing. This indicates that the line strategy is a possibility for the Russians at the beginning of a war and that an encircling movement in the early stages is a possibility. As conditions exist today, encircling maneuvers are impossible on the Franco-German front.

The Breakthrough

The breakthrough has become the major problem of modern military art. It must be clearly understood that the mission of the first assaulting wave at best can only be tactically solved, that it can only create a breach in the line. No matter how great the success of the first wave may be, it is not anticipated in this situation to change its tactical success in a single operation and drive forward through the breach it created to break down the hostile resistance throughout its depth. The breakthrough in depth requires an attack with at least two waves and the final success will come to that side which possesses the greatest depth in strong mobile organizations which are available for introduction into the fight. *Count von Schlieffen taught that the victor on the battlefield will be he who has the widest frontage and strongest flanks but the Russians must learn today that the victor can only be he whose front has the greatest depth and whose echelonment in depth is the strongest.* This indicates that no country can possess too many armed forces and makes us wonder about the absurd theories of small professional armies.

The first assault wave is made up of the infantry with many tanks and supported by strong artillery as well as infantry aircraft. Following this, for use in exploiting the successes, come more assault waves made up of armored cars, motorized infantry, motorized artillery and air force. The hostile final resistance in the breach must be crushed by an avalanche-like assault from a mass of high speed tanks and combat cars, self-propelled artillery and infantry which is brought forward on armored half track trucks. These are closely followed by the cavalry behind which numerous columns of motorized troops will be held in readiness to advance on short notice. The development of such a breakthrough must simultaneously succeed on several sections of the front to be strategically decisive.

This picture of assault units organized in depth which has as its purpose an attack coming from far in the rear and driving deep into the enemy has nothing in common with echelonment in depth of the German army in the attempted breakthrough in the great offensive of March 1918, in France. There the German Eighteenth Army had 12 divisions in the first echelon, 8 divisions in the second, and 4 additional divisions in the third echelon. In May, the German Seventh

Army reported having 14 divisions in the first echelon, 5 in the second and 6 in the third echelon. At that time the depth of each division was about 1.9 miles and the echelons in rear were designated to serve as replacements for the assault units to enable them to continue the attack. It was not clearly understood at that time that in a true breakthrough the tactical effort of the troops must be accumulative in acceleration and that this could only be obtained by the development of the onslaught from the far rear thence deep into the hostile position. Also this would have been impossible in 1918 because Germany had no armored cars and cavalry masses failed to exist at that time. The units which are to be thrust through the breach created, must by all means be extremely mobile, therefore should not consist of infantry and artillery. Despite its great style, the German breakthrough attempt of 1918 failed because of the foregoing reason. The massing of the artillery was not sufficient to subdue the hostile fire. The hostile rear area as a rule remained undisturbed and the assault artillery found that its fire was inffective on the entire tactical depth of the defense simply because it was unable to keep up with the infantry in the advance through the shell hole disrupted area. The tragic phase for these infantrymen came when after a 3 to 4 hour successful attack, supported by hundreds of field pieces spurting out their fire, to have them suddenly cease firing and permit the attack to come to a halt. It was not until the end of the World War that possibility of tanks penetrating the hostile fire front was recognized.

Problems in Leading

The new character of the operation coming from the rear naturally involves a new character to troop leading because new restrictions appear between operations and the battle. Should the main body be transported by means of the railroad, it will be found that the aviation units and the advance guards of the first echelon will already be heavily engaged in combat. The commander can utilize the echelons that follow most effectively in the situation which at that moment dictates. Enormous preparation, enormous columns, enormous technical equipment and huge supply organizations constitute an astounding task for a commander to consider, organize and lead. If the commander is not big enough for this task then chaos will result under the pressure of this

mass equipment. The preparation of service regulations for commanding of the largest troop organizations is a task still to be done. The Russian training regulations must be altered because each operative assault wave has its own tactics. These training regulations should not kill the initiative of action in isolated cases. Rapid decision which concerns hours, even minutes, must be necessary when they involve the exploitation of a breakthrough by definite waves. The army commander will be the only one at this time in this situation to announce the exact time and designate which units will be utilized at certain places. This decision cannot be made by some staff officer far behind the front lines but must be given from an advanced command post in the vicinity of the breakthrough from which the army commander can feel the pulse of the attack.

In this situation a capable staff must serve as means of carrying out the technical phase for the commander. Another section of his staff must be farther in rear to regulate the troop movements within the organization in depth. Finally the third portion of the staff must be located along the railheads to regulate the complicated supply service in the rear. It is hoped that the first utilization of the depth strategy will be made by Russia.

Critique

The question is—should the Russian theory be taken seriously or just passed over.

It is a known fact that the Red army has been in existence for 17 years and that its training and equipment has reached an unusually high standard during this period.

They claim they have the best military aviation service in the world. Another thing to be considered is that immediately after the rebellion, the Bolsheviks, recognizing the state of affairs, and without consideration of cost established a highly efficient armament industry.

In the event of a bloody conflict the Eurasion or Asiatic powers are prepared to utilize great masses of military trained youths, organizational and administrative equipment such as a large army and aviation service, and immense stores of military paraphernalia. Probably the most important of all is their producing military armament industry which unlike other civil industry need not be converted for this use. It

requires but a command to commence production in three shifts, thereby increasing its output volume many times.

Politics, moral features, etc., are not considered in this critique, because they are pliable and can be altered. The primitive people of the east do not require complicated morale building propaganda to create the war spirit. All that is required is the word that a plunder expedition to the golden west is contemplated and the avalanche of hordes will start rolling. Some people can be induced to change from peace to war just as the calm sea can become storm tossed over night. Organization, training and equipment of a military force is a serious task requiring years of painstaking effort.

The ideas of Isserson should be given serious consideration, not only from the Germans but by the other nations of Europe. In the event of a barbaric invasion which is not at all improbable, Germany must serve as a buffer to defend European culture and drive them back to their place of origin.

LESSONS FROM THE CHACO WAR

By Major G.J. Braun, Infantry

Tropical primeval forest terrain, devoid of water most of the year, served as the site for the fighting in the Chaco War. The great isolation as well as supply difficulties for the belligerents, made greater use of artillery, especially heavy artillery, difficult. Primarily it was an infantry war. Even the cavalry soon lost their animals due to the severity of climate and lack of forage and were compelled to fight on foot. The denseness of the thorny primeval forest made mounted reconnaissance impossible and the trucks supplanted the horse in handling supplies. Reconnaissance became the mission of the aviators who by much practice became adept at locating most all preparations and larger troops movements despite the dense forest. Some of the lessons derived from the Chaco War represent well-known principles; some are entirely new experiences.

There was great similarity to the Boer War and the fighting in Southwest Africa during the World War whose lessons were not fully solved. The Chaco War aided much

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in solving these questions and theories. South Africa had many examples of the use of camouflage and machine guns and the rashness and futility of cavalry attacks. The Chaco War is the first fully armed war in history where the submachine gun (Maschinenpistole) won undisputed attention.

The question of "a small elite army versus levy in mass" was solved unquestionably in favor of the levy in mass. The Bolivian peacetime army was one of the best in South America and at first only the active army participated in the fighting. Against this superior regular army the Paraguayans placed a hurriedly trained conscript army. The Bolivian regulars scored victories at the outset but soon this small elite army met defeat due to overwhelming numbers. Not until Bolivia resorted to conscription was the balance of power restored.

The training with modern weapons was not difficult; on the contrary, the entirely new weapons, such as the submachine gun (Maschinenpistole) or the Stokes mortar were extremely simple in mechanism and technique. After three months of intensive training it was possible to prepare reserves for front-line duty even though the majority of the troops were illiterates. Likewise in three months truck drivers and machine gunners were trained as tank personnel and as such made an excellent showing.

Finally the superior strength of the defense led to a new war of endurance, resulting in the exhaustion of both armies of all supplies, technical and military means of the combatants.

The idea of voluntarily not utilizing a portion of its military forces, for example, the conscripted reserve should be condemned severely. No battle of the World War nor any in the Chaco War were lost because too many troops were available; on the contrary, many were lost because there were too few available. Naturally the civilian army necessary in war should be trained as well as possible during peacetime. Poorly trained troops suffer far greater losses and more defeats than those well trained.

Bolivia entered the war with insufficient technical troops such as engineers and communication troops, and it had no motor transport, sanitary (medical) and construction troops available. Due to the shortage of combatant troops the engineers were used as infantry and their real mission neglected. The result was a poor road net behind the fronts and a tota

lack of prepared positions in the rearward terrain. The severe reverses of 1933 can be blamed on these conditions.

The motor transport service was an extremely important factor due to the great distances of the combat zone from the railheads (over 600 miles). In the makeshift organization of the motor transport troops the use of unpaid volunteer engineers and technicians proved very successful and were granted various ratings from sergeant majors to officer grades. Credit must go to these unpaid volunteer business men for the astounding rapidity with which an efficient supply service was installed. Motor transport trucks were utilized to their utmost carrying capacity in transporting troops. Even though benches were not available to the troops they endured the long day trips without undue fatigue. In war trucks must be fully utilized without regard to peacetime comfort. To this may be added that only so many trucks be allocated per unit and trucks must be fully loaded even if the unit in the motor transport column must be split. If this is not done then there will be a shortage elsewhere.

The 1½-ton truck gave better service than the heavier trucks on the unimproved roads. When transporting troops these vehicles never remained stuck in the sand or mud because the fifteen occupants could readily shove it clear. The rapidity of large troop movements was very great. These movements were able to cover 80 to 125 miles per day and even more on unimproved roads. In objection to this the tactical mobility of troops suffered when all trucks were used. One or two trucks per battalion were sufficient for the supply of rations and ammunition in position warfare. In greater tactical moves where machine guns and trench mortars had to be carried slight confusion resulted. In withdrawals or retreats a considerable amount of immobile equipment was lost.

The combat training in the use of the sub-machine gun (Maschinenpistole) took a predominant place in training of the mass of conscript troops. The cooperation of the riflemen in the front line positions with the machine gun and the light artillery, which was used only slightly, and the trench mortars (Minenwerfer), practically made the firepower invincible. *Not a single frontal attack succeeded during the entire war.*

Other than this the positions were mostly very lightly manned; there was practically no echelonment in depth nor

any reserves and in spite of this all attacks broke down before the massed fire of the machine weapons.

The shell holes served very well for the prone rifleman, for if a shell or grenade exploded nearby the fragments would fly harmlessly over the man. The locating of combat outposts in front served to confuse the hostile artillery as the true location of the main battle line with the result that the artillery preparatory fire was wasted without effect.

This method of the tactical defense predominated for a long time in the position warfare and forced the belligerents to adopt encircling and enveloping movements. A comparatively weak force in rear of an opponent was able to cut off the vital supplies to the front-line troops. The poorly prepared and supported counterattacks astride the cutoff roads were always repulsed. The hemmed in opponent then immediately resorted to an attack off the main highway and as a rule succeeded. It was most essential that the trucks and all loaded vehicles be not captured or destroyed. If the hemmed in opponent assumed the defensive and limited himself to counterattacks down the road, hoping for relief to arrive from without, then the capture and destruction of vehicular transports was certain.

The predominance of position warfare and the long time required for all military developments resulted in the annihilation of the personnel defending the long besieged forts. Delaying action with well timed final attacks on the main forces is one sacrifice to be brought out.

Surprise and its counter, the continuous air and terrestrial reconnaissance, increased in importance. Most all successes were made possible by the advantage of surprise or excellent reconnaissance. Well prepared attacks always ended in failure unless surprise was obtained.

Next to the sub-machine gun (Maschinenpistole) the outstanding weapon was the 81-cm. Stokes Brandt trench mortar. The effective fire is almost equal to that of the field pieces, as it has a range of 1,875 yards and three men can carry the weapon. The smaller mortars (47-mm.–65-mm.) were not effective enough in their fire to be useful, even though its rate of fire was ten seconds faster than the heavier weapon since fire preparations lasted several hours.

Field artillery below caliber 10.5-cm. was found to be ineffective. In the Chaco where the field artillery was equipped with all caliber guns it required just as many trucks to supply

a 10.5-cm. gun as a 7.5-cm. or 6.5-cm. gun. There was no caliber between that of the antitank guns and the 10.5-cm. gun. The much discussed Oerlikon gun failed to meet expectation. Shells equipped with sensitive fuzes were discontinued due to the numerous casualties caused by premature detonations in the weapons. Tracers were utilized effectively with the machine guns. In spite of the direction finding equipment the Oerlikons failed to bring down a single aircraft.

The small Vickers tanks had to be withdrawn due to unserviceability for that terrain, but the light Vickers 32 model did fairly well. The air-cooled motors gave best service. The tanks were transported by trucks on the marches. The tank turrets afforded a 360° field of fire when used in defense in underbrush. The tanks were moved behind cover so that only the camouflaged turret was exposed. Individual tanks gave good service in this manner during defensive operations but many were utilized in the attack.

Due to the difficulty of reconnoitering the terrain and the lack of serviceable maps the air photos gained great prominence. In spite of this the old useless maps were used throughout the war and recent photographs were difficult to get for issue. March directions were mostly given by compass.

No chemicals were used even though the artillery and air service could have utilized same. Had one side used chemicals it would have soon brought on chemical reprisals from the other side. This would have required gas masks and gas training for the troops which would have been an almost impossible task. It would have been unbearable to wear a mask any length of time in that tropical heat. There is a possibility that similar situations might arise for European nations and gas be ruled out of the combatant weapons.

As in all wars of the past, man, the individual soldier, was the decisive factor. The physique and morale, fighting instinct and intelligence combined with the love for his country and hatred of the enemy, of the soldier, make a big difference in war, likewise numbers and armament, not considering racial differences, a systematic training and years of objective propaganda achieved much to develop the above. Initial success helped much to develop a lasting feeling of superiority. Position warfare soon developed a listlessness which produced serious results. Fatigue and listlessness was prevented by frequent reliefs.

Both sides suffered heavy casualties among their officers at the outset of the war. In the beginning all officers were white but due to the great losses white replacements were not available. Replacements were made by natural born leaders developed in the field without regard to education.

TANK ATTACKS AT NIGHT

By Major G.J. Braun, Infantry

Most nations which are equipped with modern armaments are interested in the capabilities of the latest tanks under special circumstances. The topic "tank attack at night" is selected because the unanimous opinion seems to be that such an attack is out of the question.

It is interesting to note that this view is not accepted by foreign powers as shown by their utilization of armored cars for reconnaissance at night despite the views to the contrary that the crew can see nothing at night. The fact is that armored cars are used for night reconnaissance. It is also a fact that troops at rest never forget to provide for their security at night. They establish proper defense against armored cars by barriers and antitank weapons.

The following narration describes two night tank attacks conducted during the World War, both of which were unsuccessful. These are of great interest because of the lessons derived from them and their failure can be traced to their lack of preparation.

British Night Tank Attack

(See Sketch No. 1)

Plan of Attack: On 10 August 1918 the British tank commander received instructions that his tank platoon, cooperating with the Australian 10th Infantry Brigade, would attack long the Amiens—St. Quentin road that night. The operation had been so hurriedly arranged that no written orders were available. Staff officers were intoxicated with the great success of tanks at the beginning of the drive on 8 August and felt there was no limit to their devastating effect on the enemy. Under cover of darkness, about 10:00 PM, the tank platoon was to conduct the Australian 37th Infantry

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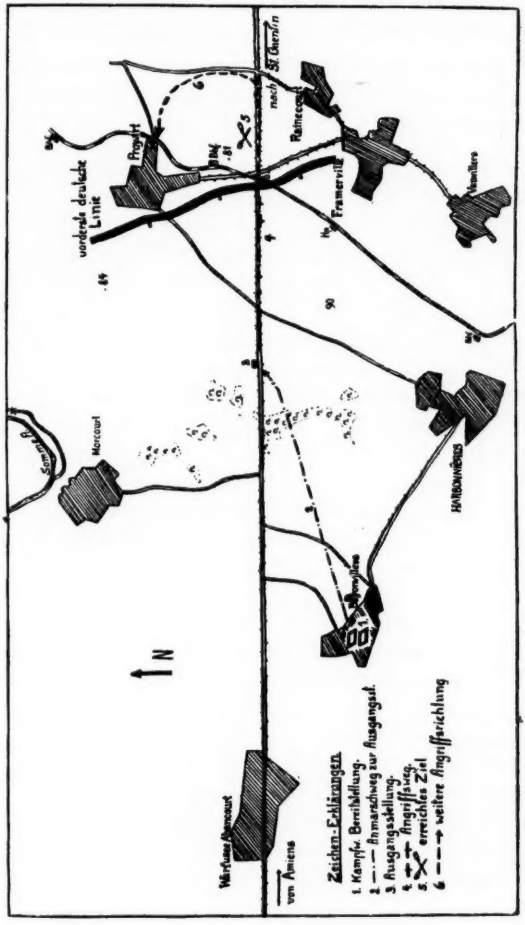
Abstracted from *Sanct Christophorus*, May 1935. "Kampfwagen-Angriff bei Nacht."

Battalion against Proyart with the object of adjusting an inter-corps boundary. A second battalion of Australian infantry accompanied by another section of tanks was to move up in reserve. The starting place where the tanks were to pick up the infantry was a place marked on the map as "Hospital." Instead of making a frontal attack on Proyart the plan was to penetrate the enemy line about one mile farther south where it crossed the Amiens—St. Quentin road.

SKETCH No.1



Legend: 1. Tankpark. 2. —·— Road to assembly position. 3. Assembly position. 4. ++ Direction of attack. 5. ✕ Objective. 6 --→ New direction of attack.

This was believed to be La Flaque. After proceeding along the highway for ¾ mile the column was to turn north at a prescribed crossroads and by an encircling movement attack Proyart from the rear.

Formation for Attack: The advance was in spearhead formation—one flank on the road and one 50 yards on either flank, the infantry following on the road. As soon as the whole column had turned north, fast armored cars, with glaring headlights, were to dash along the Amiens—St. Quentin road. The idea was to deceive the enemy into thinking that the attack was in that direction.

Note: The tank used for this main mission was the Mark V British heavy tank with a crew of 1 officer and 5 men with a maximum speed of 7 to 8 miles per hour.

The participants of this novel operation realized its risks for tanks had never been used at night in this manner. Much had to be left to chance, for owing to the shortage of time, none of the normal work in preparation or precautions had been done. None of the members had the slightest idea of the nature of the terrain. To the restricted vision of the terrain from within the tank was added the necessity of darkness within the tank. There was also the danger in case of an engagement of the tank gunners mistaking their own infantrymen and firing on them. The tanks and infantry had to remain close together to prevent this. The danger of being ditched also was very great. And it was certain that the enemy, from his previous experiences with British and French tanks, would organize a tank defense with artillery, antitank rifles, and armor piercing bullets, especially where his line crossed.

Events as they occurred: At the time the orders were received the tanks were carefully camouflaged in a hedge in the ruined village of Bayonvillers, about 2½ miles from the "Hospital." On the way up while crossing the terrain, a hostile plane appeared to the left. Cover was taken by some trees in the hope that the plane had not spotted them as it was still broad daylight. Reaching the rendezvous at 8:00 PM, the tank commander reported to the commander of the 37th Battalion. Here he was informed that the zero hour had been changed to 10:00 PM.

At the appointed hour the 3 tanks moved forward in the twilight at the head of the infantry which followed in single file. It soon became apparent that the tanks could not move along the flanks as planned as the flanks were covered with dumps and old earthworks. It was decided that all three tanks should keep to the road. An infantry reconnaissance officer was responsible for the direction, especially for the exact point where the whole column was to turn north after piercing the enemy line. The tank commander was directed to accompany the infantry commander to be at hand if he wished to give any particular orders for the tanks.

The crossroads at La Flaque were reached as darkness fell. Opposition was anticipated at this point. To their surprise no opposition was met. This gave way to the feeling that the enemy had withdrawn his lines to a point farther back or that the tanks had been observed moving up in the daylight and that a trap awaited them. The night sky in front appeared peaceful and calm. If the enemy was in the vicinity he certainly heard the clatter and noise of the approaching tanks in this stillness. About a quarter of a mile from La Flaque the roar of an airplane was heard overhead, a downward whizz, a blinding flash and a terrific explosion. The unditching beam from the rear tank was blown high into the air and crashed back. Other bombs fell; this was the exact point where the enemy held his line. Flares immediately made the night as bright as day. Then hell broke loose, withering machine-gun fire opened on the tanks, causing the infantry which had been following close behind, to seek cover in the ditches.

The tanks replied with their 6-pounders and machine guns but without effect, for no targets could be seen. The peculiar feature was the lack of flashes to fire at. The accompanying infantry advanced by rushes. The hostile artillery now started to register on the tanks with shells exploding on the road and to the side of it. Due to the severity of the fire the tanks had halted and after a half-hour there was a short lull, except for desultory firing. The commander of one of the tanks reported to the tank detachment commander that the enemy had riddled his tank using antitank guns and armor-piercing ammunition. He was badly wounded and had stepped out of the tank to keep in touch with the infantry since nothing could be seen from within the tank.

The tanks started to move again and immediately were met by violent machine-gun fire causing the infantry to take cover again. Suddenly a runner came up with the message that the tanks were returning. No order had been issued for their return. This had to be countermanded by the tank platoon commander who had great difficulty in transmitting these orders to the tanks without being crushed as they were so close together. The colonel commanding the infantry battalion was killed and so was the commander of one of the tanks, while walking alongside his tank in an effort to keep in touch with the infantry. All but two of the crew had been wounded by the armor-piercing bullets which had perforated the tank. The second driver who assumed command has turned his tank to engage what appeared to him to be a strong point. This was the maneuver which gave the impression that the tanks were returning. The other tank also suffered and was now in charge of a corporal with most of the crew wounded.

As soon as the tanks again moved against the enemy the adjutant of the infantry battalion informed the tank commander that due to the heavy losses the infantry would have to retire in extended order. Reluctantly the tank commander gave orders for the tanks to face about for the return. This maneuver was quite difficult and every move started a fusilade of bullets.

After moving back about 150 yards the tank platoon leader was confronted by an officer from the 2d Battalion who brandished a revolver in his face, mistaking him for the enemy. So great had been the noise that the approach of the reserve tanks had not been observed. There was a hurried consultation with the reserve commanders and it was decided to halt and await orders from the brigade commander. In the meantime the tank platoon covered the withdrawal of the infantry. Instructions were issued for the tanks to remain silent until the infantry had been withdrawn, then to return to their line.

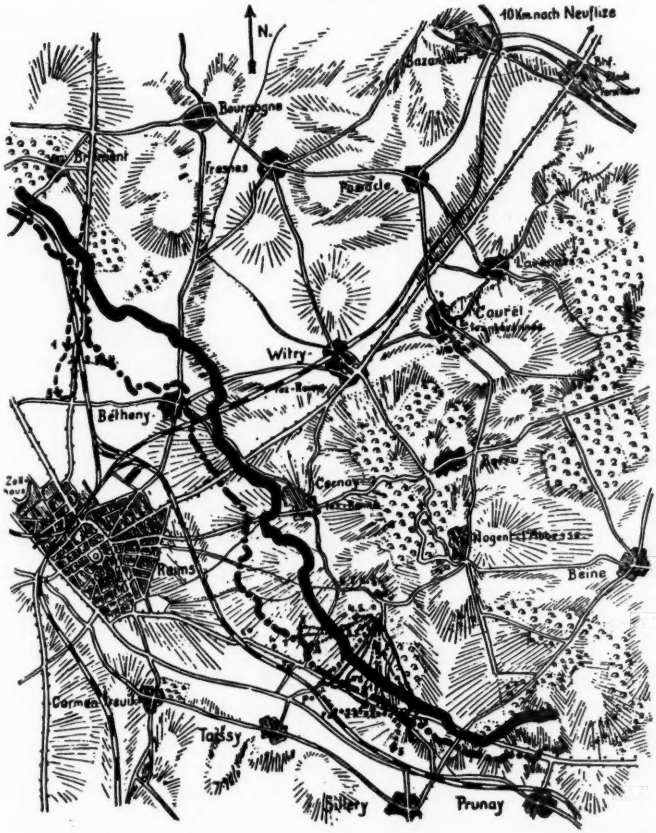
The report of the tank platoon commander to the brigade commander admitted that the use of the tanks was a hindrance to the infantry who lost 900 of the 1,000 men in the battalion, including the commander. Incidentally the friendly infantry along the line threatened to shoot the tank crew if they moved the tanks, as these vehicles were drawing so much hostile fire.

German Night Tank Attack

(See Sketch No. 2)

The 2d Tank Detachment, consisting of 5 heavy "A 7 V" tanks, was engaged with similar units in the battle areas about Soissons and Rheims. At noon, 31 May 1918, the detach-

Sketch No. 2



LEGEND: ▬▬ German position. –·–·→ Direction of attack of Tank Bn. No. 2 (5 tanks). ·····→ Direction of attack of Tank Bn. No. 1 (5 tanks). +++→ Direction of the 5th tank of the 11th Tank Bn. ▬·▬ French position.
⇒ Direction of attack of Tank Bn. No. 13 (3 tanks)
—·—·→ Direction of attack of Tank Bn. No. 14 (4 tanks)
——→ Direction of the 5th tank of the 12th Tank Bn.

ment moved in compliance with orders into its position of readiness at Bazancourt. Here it received orders from the 242d Infantry Division at 8:00 PM that it would participate in a contemplated attack on 1 June 1918. In compliance with these new orders the detachment was moved forward to the line of departure in Brimont which was about 11 miles away.

The combat mission directed that the the 2d Tank Detachment in cooperation with the 3d Battalion 476th Infantry Regiment will be engaged in the general direction of Tollhouse (Zollhaus) located at the west exit of Rheims. Along the route, about 300 yards east of the Pierquin Farm it was to silence a machine gun nest located there. The tanks were to support the attack of the 3d Battalion against the northwest edge of Rheims and silence the machine gun nests and strong points located at the road exits and demolish hostile defense works in the outpost area. Tanks numbers 2 and 5 were to move out in the direction of the road: Brimont —Rheims to silence the machine gun nest 300 yards east of Pierquin Farm and then follow the advance of tanks 1, 3 and 4 in the direction of the attack of the 3d Battalion 476th Infantry Regiment. After passing through the viaduct, tanks 1, 3 and 4 were to follow a southwesterly direction.

Progress of the Attack: The detachment with three tanks, left their line of departure at 7:00 PM, 31 May 1918. Tank number 3 was delayed one hour due to a defective exhaust pipe, tank number 1 was left behind at Bourgogne due to overheated bearings. After filling the grease containers and completing some minor repairs on the water pump it was able to follow along at 9:30 PM.

Between 8:00 PM and 9:00 PM, tanks numbers 2 to 5 passed through the viaduct. The two leading tanks brushed aside the barriers and *cheval de fries.*

At 8:20 PM, the three leading tanks when 1200 yards south of the viaduct were suddenly fired upon from the left flank by artillery of medium caliber. The leading tank replied to this fire with its field piece and machine guns but due to gassing and a direct hit from a hidden trench battery, the unwounded members of the crew were compelled to leave the tank. This artillery defense had not been anticipated; apparently the location of the hostile battery was unknown to the division as the division did not notify the tank commander

of its existence. Only searching fire had been anticipated. The machine gun nest 300 yards east of the Pierquin Farm was only supposed to be occupied by machine guns but it was found that in close proximity to the next was this hidden battery of 4 guns with about 50 to 150 yard intervals. Without doubt these were part of the antitank defense. The location of the machine gun nest and also the battery was known to the German infantry (125th Infantry Regiment) located here. Tank number 5 was also put out of action by a direct hit. Further advance by the remaining tanks over this unfavorable terrain, especially on the road, was impossible due to the direct artillery defense. It was impossible to leave the road because of the flanking ditches which were 7½ feet wide with high banks. The commander ordered the tanks back with instructions to take cover under the viaduct. Here they ran into tank number 1 which had remained behind.

In the meantime a hostile counterattack drove the German infantry past their front lines. Darkness had fallen and observation became impossible and the detachment returned to the line of departure.

The attempt to salvage tank number 5 at 11:00 PM was unsuccessful and it was left in the hands of the enemy. The results of this enterprise, in addition to the loss of one tank, was 3 dead, 2 wounded as well as 2 officers and 1 man gassed.

* * * * * * *

Both of these unsuccessful enterprises had suffered heavy losses and were without results. The use of tanks in the British enterprise harmed the infantry more than it helped them. It might well be concluded from these two experiences that the employment of tanks in darkness or night is impossible. Unquestionably many points are unfavorable to their usage such as fire effect without observation. As it is difficult for tanks to negotiate strange terrain in daylight it can be seen that it is far more difficult at night, even with lighting facilities (search lights and rockets).

If in the following writing an effort is made to favor the use of tanks at night in restricted circumstances, it must be definitely remembered that there had been no preparations in the necessary spheres for the World War night tank attacks. Preparation is the answer to the question as to their feasibility.

The following views are based on the 1933 pamphlets "Tanki w Notschnoj Atake."

Future Use of Tanks at Night

The utilization of available means as well as painstaking preparations would justify the use of tanks at night in limited circumstances. It must be definitely understood that such tank utilization would have great morale possibilities. Since it is admitted that a night tank attack is a possibility, the following inferences relative to defense can be drawn. It is the object of the following statements to make this defense easier.

Only limited objectives can be considered for these attacks, because exact knowledge of the terrain by the tank crew is essential, also the preparations must be exact and definitely known to permit all other weapons to render effective support throughout the progress of the attack. The tank attack starting in darkness and continuing until dawn in its first phase, is an attack with limited objectives, and if successful in its surprise can be continued into the day with great success.

The great advantage of a night tank attack lies in the fact that the enemy is scattered and distracted and if the surprise is successful there will be very little effective defense to be reckoned with. The greatest difficulty of this enterprise lies in the fact that the firing effect of tanks is especially limited (particularly the firing of the tank cannon), that even the friendly tanks as well as the friendly infantry, which must exploit the success, is endangered therefrom. This difficulty is so great that it is imperative that all special weapons be utilized in assisting in the attack.

Minute and detailed preparation has been previously mentioned as essential to success. The most suitable situation for this type of enterprise would be the recapture of a section of terrain which had been lost as a continuation of some important attack or to relieve the pressure on friendly forces from an aggressive enemy.

The forward movement of tank units to their position of readiness for an attack involves no difficulties because the route can be reconnoitered and marked; for example, the roads can be repaired by the engineers. All weapons, including aviation, must assist in overcoming the noise of the approaching tanks.

The preparations must include:

(a) Instruction of the participants relative to the details of the attack, the terrain, the attack objective, and location of hostile weapons.

(b) The preparatory position must be such that every tank can easily debouch from same and immediately drive at its objective.

(c) Decide on all details of the attack, the sector that is to be reached by known landmarks to prevent confusion.

(d) Decide how the infantry is to follow.

(e) Installation of searchlights to light the attack route and the attack objective.

(f) Decide on the targets to be engaged by the aviation, artillery, as well as the heavy infantry weapons.

(g) Control and conduct of the attack.

One of the most important means of making an attack successful is the use of searchlights which can indicate direction during the tank attack, and can illuminate targets for the tanks and other weapons and blind the enemy. Light rockets (even with greater burning time) are not entirely suitable.

Searchlights can be installed in the following manner: Set up one row of searchlights. Each light has a specially assigned mission: accompany and guide the tanks with its light cone so that the tanks can definitely see the ground ahead of them without being blinded by the lights or silhouetted.

The light cone will illuminate the objective to be attacked by the tank and blind same by its glare. It is best to have the searchlight protected by armor plate and have a weapon alongside of it which immediately engages a target when discovered and prevent same from operating against the tanks.

The use of searchlights from the tanks themselves has been considered but the swaying of the tank makes their use difficult. This use would not make the previously mentioned set up superfluous.

There must be close cooperation and liaison between the tank and the searchlight personnel; for example, during the penetration of the enemy, on arrival at a definite line or during the withdrawal from the battlefield.

The support of the other weapons must be rendered in the following manner:

The artillery engages known and definitely located targets, the air service executes its bombing missions, the heavy machine guns and trench mortars will also engage known and definitely located targets. All weapons will utilize the effect of the searchlights to support the tank attack by repulsing any hostile resistance that may appear.

The infantry must closely follow the tanks along a broad front and in depth to quickly subdue the hostile defenders, occupy the terrain gained and prepare same against counter-attacks. For this purpose the infantry is assigned by detachments to certain tanks. Specially assigned weapons must be prepared to repulse hostile counterattacks.

Engineer troops must accompany the attack to eliminate such obstacles as were unknown heretofore. Intercommunication must be maintained by use of wireless (Sprechfunk) and telephone, by runners, flares, visual lights, lanterns and torches as signals for the advancing troops from the staffs or front lines. Also signals from the aviators by lighted streamers, etc.

The tanks should advance in line with an interval of about 20 yards, and in waves of 20-yard distance from the first wave. When the leading tanks reach a definite sector the others overtake them and not until then do they open fire.

The conduct of the attack can be visualized by the terrific noise of the firing of other weapons drowning out the noise of the tanks until they reach the designated line which when crossed would be the signal for the beginning of the attack by, for example, an aerial bombardment. The searchlights would light up and all scheduled weapons would open fire on the designated targets. The infantry detachments would follow at a distance keeping the tanks in sight. It is especially important that everything starts at the proper moment and that absolutely no changes occur in the attack plan except where the situation would make same imperative.

For the repulsion of expected hostile counterattacks, infantry units and tanks must be in readiness with searchlights which have instructions not to illuminate until the hostile counterattack starts.

* * * * * * *

The foregoing procedure does not permit any gaps. It only designates which means can be utilized to make a tank

night attack possible with any hope of success. There is no question that a well prepared attack, in comparison with the war examples, would be successful. It is also understood that all participants have been previously instructed in this method of attack and rehearsed same. A moonlight night would greatly enhance such attacks.

It would be wrong to believe such enterprises to be impossible in the present day and it is essential that plans to counter such attacks should be given thought.

MOTORIZATION OF THE JAPANESE ARMY

By Major G.J. Braun, Infantry

Motorization and mechanization have become second in importance to aviation in the development of the Japanese Army. Not only are the Japanese carrying out the motorization of their weapons but they are constructing the latest type tanks and combat cars for the army. Due to the shortage of horses the army was compelled to utilize trucks. For this reason Japan has accelerated her truck manufacturing industry to eliminate the necessity of importing these vehicles. It is only a question of time before she will be able to manufacture all the large mechanical appliances required for her military units.

The Swedish periodical *Krassnaja Swjesda* states that up to 1931 the Japanese Army was far behind modern armies in motorization and mechanization. Up to this time the Japanese Army only possessed 100 tanks of obsolete foreign construction. Not until 1932 did she manufacture her first tank, the model "89"; this was followed by quantity production of these tanks the same year. In addition to this tank they manufactured a lighter one, model "92," which was accepted by the army.

Similarly, until 1931 she had but 150 armored cars, all of which were of foreign construction; for example, the Vickers Crosley, Lanchester, Guy Vickers types. Not until recently have they made their own model "92."

The only automotive manufacture up to this date had been in trucks.

Abstracted from *Sanct Christophorus*, April 1935. "Die Motorisierung des japanischen Heeres."

The Tank Troops

In 1933 the tank service was reorganized, the former two battalions were enlarged to two regiments. The regiment stationed in Kurume is quoted as consisting of 3 battalions of 3 companies each. The companies are organized in 3 platoons per 5 tanks and one reserve echelon of 3 to 5 tanks. According to this the battalion has 60 and the regiment 180 tanks. In addition to the foregoing each battalion is equipped with one communications tank. In October 1933 the second regiment was organized at Narassino. Its organization is identical to that of the Kurume regiment. In addition to these there is a third regiment of 140 tanks in Manchuria at the disposal of General Headquarters for use in the combatant divisions as needed. At present Japan has approximately 750 tanks. Their plans are to fill the battalions to 150-170 giving them a total of 1400 tanks.

Tank Characteristics

The Japanese still possess about 60 obsolete "Renault 1917" tanks and British "Whippet A" which were used at Shanghai. These weigh 14 tons, have a maximum speed of 8½ miles, are armed with 4 machine guns and have a crew of 4 men. In addition to these they had the French "St. Chamond model 1924" tank, also the heavy "2C" tank, weight 68 tons, armed with 7.5-cm. gun and 4 machine guns.

The Japanese modern tanks consist of the small "Carden Lloyd" type.

The Japanese Model "92" light tank is manufactured by the Issikawasima factory in Tokio. This model possesses the following characteristics: weight, 3 tons, speed, 31 miles per hour driven by a 45 horse power air-cooled motor and armed with a 7.5-cm. gun (approximate caliber) or with 2 machine guns in the turret (one of which is a heavy machine gun). The tank is 12.8 feet long, 5.3 feet wide, 6.06 feet high, has 8-mm. chromium nickel steel armor and is operated by a crew of 3 men. It is capable of crossing trenches 5.2 feet to 5.5 feet wide and can operate in 2.6 feet of water. This type of tank has been accepted by the Japanese Army to be used in cooperation with the armored cars with cavalry units.

The light "Etsu B" tank apparently is a variation of the French Renault "N.C. 27" but its motor is more powerful being 75 horse power instead of 60 horse power, and possesses

an approximate speed of 12.6 miles per hour. It can be described as follows: weight, 8-9 tons; length, 14.3 feet; width, 5.6 feet; height, 7 feet; armament, one 3.7 or 5.7-cm. gun or with a machine gun; armor, 20-30-mm. and a 2-man crew.

The Japanese copied their model "89" from the medium British Vickers "C 27" tank of which they had purchased 40. The British "C 27" is equipped with a 100 horse power motor and can travel 18.6 miles per hour. Its weight is 11.5 tons and its armament consists of one 5.7-cm. gun and 4 machine guns.

The Japanese medium tank model "89," referred to above, was manufactured in 1929 by the Issikawasima and the Tokpo-Gagu-Denki factories. These concerns manufacture most of the tanks for the Japanese Army. Some of these tanks have water-cooled and others have air-cooled motors. The latter type were mostly utilized in Manchuria because of the scarcity of water there. Their maximum speed is 18.6 miles per hour and they are equipped with one 3.7 or 5.7-cm. gun in the revolving turret and two machine guns, one in the revolving turret opposite the cannon having a firing arc of 180° and the other built in the front tank panel. Its armament which is supposed to give protection against 13-mm. caliber ammunition is of 15-17-mm. chromium nickel steel. This tank weighs 10 tons and is manned by a 4-man crew. Experiments showed that the tracks were too heavy causing the bolts to break.

In 1932 the Japanese constructed a new medium tank weighing 16 tons and armed with a cannon and several machine guns. This tank is still in an experimental stage.

The heavy model "91" tank, which is also built in Japan, being driven by a 150 horse power motor, can travel 15½ miles per hour. This tank, operated by a crew of 4 men, weighs 18 tons and is armed with one cannon and 4 machine guns. It has 20-24-mm. armor and can cross 10 foot trenches.

The British light Vickers used by the Japanese weighs 6 tons and is armed with one 3.7-cm. gun and 1 machine gun in two turrets. It was principally used for experimental purposes.

The Japanese amphibian tank was presented to the army by an electrical concern in Tokio. It is equipped with one machine gun in the revolving turret. It is propelled on tracks.

The Japanese utilized their troop transport tanks in Manchuria. These were lightly armored, had the Carden Lloyd chassis and were driven by a 50 horse power motor to give a speeed of 25 miles per hour. The Japanese not only used these tanks for troop transport but also for forward supplies, and ammunition to the front line.

It is rumored that Japan also has two remote controlled tanks designed by Major Nagajama. Experiments have demonstrated its ability to move forward at various speeds, turn, load and fire the weapons, drop mines and deliver audible directions.

Training and Experiments of the Tank Troops

The combat training is very thorough applying to combat situations as they would exist. The marksmanship training predominated in these tests. On special firing ranges the Japanese have experimented in firing from and at tanks. Also their training covers cooperation and combined action with other weapons in large units and in small units, for example, single tanks with infantry squads.

Experiments have also been made relative to the endurance of the personnel and equipment. For this purpose 60 tanks carried out an experimental march of 279 miles.

Armored Car Units

Formerly the armored car personnel was part of the tank battalions. In the reorganization they were formed into companies to be attached to large units or tank units. At present they have about 300 armored cars.

Armored Car Types

The Japanese have the following types of armored car:

The British armored car "Vickers-Crossley" model 1925, with the following characteristics: weight, 4.85 tons; maximum speed, 36-48 miles per hour, 50 horse power motor; armament, 2 machine guns; crew of 4 men. During the 1932 operations this armored car was the principal one used by by the Japanese Army.

The British "Rolls-Royce" armored car (weight, 4.2 tons) was formerly used in great numbers but is now being replaced with later types. Also the Japanese armored car "Model 1923-25" is being rapidly replaced by new equipment.

The 1932 six-wheeled armored car "Model 2592" is of Japanese construction, weighs 5.85 tons and possesses a maximum speed of 36 miles per hour, having a 75 horse power motor, 2 machine guns—one in the revolving turret and one built in the left front. There are also attachments on the sides for machine guns. It has a crew of 4 men.

The Japanese Marines use another model 6-wheel armored car which has half tracks front and rear. This has 3 machine guns—one in front, one in the revolving turret and one set in for antiaircraft defense. Additional machine guns can be placed in the side walls of the car.

It can also be stated that the Japanese possess armored trolley cars (Panzerdraisine) with interchangeable wheels for rails and road. There are built-in jacks for lifting the vehicle during the changing of rims for the wheels. It requires 2-3 minutes to make the change. The weight of this vehicle is 7 tons and its 40 horse power motor can drive the car 28 miles per hour. Its armament consists of 1 machine gun in the revolving turret and appliances for machine guns on the sides. It carries a crew of 6 men. There are about 30 of these cars in Manchuria.

Neither the 4-wheel or 6-wheel armored cars gave good service in Manchuria. These may be replaced by Model "92" tanks.

Motorization of Weapons

At present the Japanese Army has no motorized infantry units. Only in one incident was an infantry regiment reinforced by an artillery detachment moved by trucks and once an infantry brigade was transported by a motor transport regiment consisting of 677 trucks.

During peace time they have a 3-company motor transport unit with only 22 trucks, which was increased to 60 during war.

They contemplate increasing the number of trucks for the engineer and signal battalions, railroad regiments, cavalry brigades and chemical warfare and supply units. At present each division has more than 60-75 trucks (about ½ of which are 6-wheeled vehicles of Japanese manufacture) for the supply service.

Progress of Motorization

It is their intention to mechanize one infantry regiment per infantry division, to consist of 4 to 5 infantry companies,

one battery, one small tank, one motorcycle (Kradschützen) and one armored car company, one motorized communication platoon and one motorized chemical warfare platoon. With attached cavalry the mission of this regiment is reconnaissance, encircling or envelopment, pursuit, as well as covering a withdrawal. This organization is contemplated for service in China.

The entire heavy artillery is motorized, the medium artillery is about 25% motorized, but the intention is that the division artillery remain animal drawn. The light corps artillery is completely motorized for which they have armored ammunition trucks.

The existing armored car squadrons of the cavalry divisions are to be expanded into battalions and two of these armored car squadrons are to have 8 to 10 armored motorcycles equipped with 13-mm. machine guns, as well as one for antiaircraft service. The artillery with the cavalry brigade will be motorized, as will half of the combat and supply train. Remaining units will be entirely motorized.

At present the Japanese have started to motorize their communication service (signal service), also the engineer battalion, staff and supply units.

It is also their intention to organize tank brigades, consisting of 3 to 4 tank battalions (with light and heavy tanks), one artillery detachment on self-propelled gun carriage, as well as motorized communication, engineer and supply units.

Attempts to Improve Motorization

In addition to the combat training numerous researches are being conducted by the Japanese for usable equipment in the motorization of the army. Experiments were carried out to convert commercial trucks into armored cars by application of armor plate. All trucks were tried out for winter service. Every effort is made toward standardization of trucks in the army. In addition to the preparation for procurement of trucks in case of mobilization the Japanese conduct training courses for civilian drivers in convoy and other features of military driving.

The army authorities are especially advocating the gas generated trucks. The Motor Transport School in Sutagaja is conducting experiments with this type vehicle. Long experimental and propaganda trips are made about the country

to interest the populace in this type of vehicle. The War Department controls all manufacturing concerns which convert benzine for the gas generator motor. These are all subsidized concerns.

* * * * * * *

The foregoing is a review of the extent of the motorization of the Japanese Army. The speed with which they have accomplished this represents remarkable energy and determination once they recognized the great necessity of this modernization. It is food for serious thought by military students.

APPROACH MARCHES

By Major F. During, Infantry

The French maneuvers and exercises in recent years have given the author the following impressions:

(1) That in approach marches preceding the gaining of contact, the advance of the French infantry has been made at a dangerously slow pace.

(2) That the attitude of French reconnaissance elements has been one of exaggerated timidity.

The examples which might be cited are numerous. For instance, a few years ago, the advance guard of a division on the march to gain contact with an enemy likewise on the march, covered 2½ miles in 6 hours without having gained contact. More recently, the advance guards of another infantry division, charged with a clearly defined offensive mission, covered 3 miles in 6 hours without having been subjected to a single enemy shot. In 1931, an infantry regiment executed an approach march of several hours without encountering any enemy forces in spite of the fact that the plan contemplated an attack, but it took such precautions that it was unable in the course of an 8-hour slow-pace advance, to gain contact with an enemy flank guard at a distance of 9 miles. Finally, in the course of maneuvers of small units, reconnaissance elements have stopped short at the first shot fired in the distance instead of endeavoring to maneuver by infiltration. Again patrols have been known to hesitate and mark time, or scouts whose entire education seems to have been guided mainly by a spirit of prudence.

Abstracted from *Revue d'Infanterie*, May 1935. "L'Infanterie au ralenti," by Lieutenant-Colonel Hurst.

According to the author, the causes of such slowness and hesitations—insofar as the slow approach march, exclusive of the gaining of contact is concerned—seem to be due to:

(1) Too rigid an approach march formation with its corollaries:

(a) Premature abandonment of the route of march.

(b) The infantry being hedged in a checker-board of bounds and limitations, with scattered restrictions.

(c) Exaggerated use of a rigid system of supporting fires (bases de feu).

(2) The unfortunate practice of the leader who at every echelon remains tied to his command post.

(3) Too great a desire for invisibility and too great a use of the terrain by the reconnaissance elements of the advance guards.

(4) Too great a concern about the fire factor to the detriment of the movement factor.

Insofar as the hestitations of the reconnaissance elements are concerned, they are due to a characterized lack of boldness displayed by all these elements.

In the approach marches which have been witnessed since the War, the attack formation is no longer a mere possibility provided for, but however distant the enemy may be, such formation is actually prepared in order to be able to go into action at any moment. Instead of a covered flexible march which can be better adapted to the route enabling the latter to be used to a greater extent than it is, we see the slow advance of a formation cramped by a preconceived plan of attack and a prisoner of its concern with regard to liaison and fire.

In the opinion of the author, it is far more the idea of the moment when it will be possible to gain contact with the enemy that should govern the time when the route should be abandoned, than the idea of avoiding the fire of distant enemy guns.

To parry the latter, it will be sufficient for the advance guards to be echeloned in breadth and depth and to be sufficiently supple to be able to resume rapidly the approach march formation.

Approach formation will be taken either by order of the division commander, or upon the initiative of the advance

guard commanders as the result of information received during the march, in order that the advance guards may be in a position to constitute in due time a combat frontage along the entire zone of the infantry division.

It should be noted that in the future, the use of mechanized security detachments will increase the protection of the advance guards and will permit them to advance in march formation for a greater length of time.

The usefulness of an advance by bounds is unquestionable if one wishes to go into action in excellent order. It is a framework designed to show everybody the will of the commander and to mark out at all times the eventual intervention of the artillery. But until the advance guards have gained contact, the advance must be effected with flexibility, at normal speed and all initiatives having free play. No useless halts on the fixed bounds, no alignment of the battalions on each of them, no liaison detachments when they are manifestly useless.

The liaison between battalions must consist of saying to one's neighbor at each bound, "I have arrived at such and such bound, I am continuing," and not, "Are you at such and such bound and may I continue?"

On the other hand, the leader must avoid issuing orders like the following: "Only on my orders will you start on the next bound," or "The advance guards will not go beyond such and such a line before the main body has reached such other line."

Such orders cause unavoidable and dangerous delays on account of the reflexes they cause in the minds of the executants.

When the advance guard is about to gain contact, on the contrary, prudence and the necessity for the leader to have at all times a coherent formation in hand, demand that halts be made on such or such objective; that permanent liaison be established between the battalions; in other words, that precautions be taken and that many restrictions be made with a view to insuring perfect coordination of efforts.

The exaggerated use of a rigid system of supporting fires, which is a natural consequence of the practice of making an approach march in an attack formation ready at all times to go into action, is further exaggerated by a real mysticism of fire support which since 1928 has laid hold on the minds of French infantryman.

In the course of an approach march, the infantry must be satisfied with a potential fire support, namely, that which the artillery would insure eventually, and with the possibility that certain infantry arms pushed forward in the approach march formation, going into action rapidly.

The unfortunate practice of the leader who at all echelons remains tied to his command post is far more marked in our post-war infantry than it was prior to 1914. Here again, as in many other domains, stabilized warfare has left scars, that is, a lack of movement which is overcome with difficulty. The advantages of having a chief who moves about are well known: he reconnoiters his ground, is closer to information sources, makes quicker decisions and therefore saves time, resulting in an increase of the speed of the march. Furthermore, the presence of a leader forward has a decided stimulating effect upon his subordinates insofar as pressing forward, and promoting all-around activity are concerned.

The desire to escape airplane observation, ground observation and sometimes observation by the High Command, has gradually led to the belief that a successful maneuver is one where there is nothing to be seen.

This method of thought should not be absolute and should not apply to every kind of maneuver.

For instance, when troops in rear of an occupied front are called upon to move forward in the day time from Zone A to Zone B, the maneuver will have been a good one if a proper utilization of the terrain and of cover has been made, resulting in completely concealing the movement from air or ground observation.

If advance guards in an approach march are considered, the maneuver will be a poor one if, in order to escape observation, they slow down their rate of march to the extent of jeopardizing their mission. The obligation for them to insure at all times sufficient protection to the main bodies, requires that they endeavor to speed up their march. By speed we mean a regular march without any useless halts. As a matter of fact, the speed of a foot soldier is that of his constitution and load. But his mind, and especially that of his chief, can and should conceive and act at all times quicker than that of the enemy.

While the combat echelons and the advance guards reserve, which are not called upon to reconnoiter a zone, as

are the reconnaissance echelons, may endeavor to escape observation in any part of the zone affording better cover, they must nevertheless endeavor never to slow up the advance of the reconnaissance echelons and must at all times be capable of giving them support and affording them refuge.

The reconnaissance echelons must have primarily the idea of advancing from one point of observation to another in an endeavor to obtain the information the commander is anxious to secure.

Does that actually happen as a rule? Or is it a game of hide-and-seek with the enemy which results in "maneuvering" across the terrain, constant halts, fear of leaving shelter and the risk of units crowding together and losing their direction?

Too great concern about the fire factor is detrimental to the movement factor.

In the gaining of contact, the concern with regard to insuring proper fire support to the advancing elements, preys on the mind to such an extent that the measures necessary to insure as rapid an advance as possible, to maintain contact with an enemy which has apparently disappeared, and to take means of infiltration, are oftentimes given secondary importance when they are not completely neglected.

Movement is one of the infantry's weapons, which it must know how to use as well as other arms. The importance of the fire problem must not make it lose sight of the movement problem. A good infantry is one which knows both how to use its fire in order to help its adjacent units in their advance and how to advance by taking advantage of the fire of these same adjacent units.

Fire will not insure success unless it is backed by a keen sense of infiltration and forward movement.

For the past years lack of boldness on the part of all reconnaissance elements has been noted.

It is manifested by hesitation, actual fear of advancing displayed by reconnaissance elements, even when not under fire, and, when in contact with the enemy, by halting and marking time on the part of these elements as soon as a few isolated shots have been fired.

In contact with the enemy, the lack of boldness of reconnaissance elements prevents all infiltration and consequently all possibility of giving to the commander the necessary information upon which to base his decision. Due to this

fact attacks have been launched over unreconnoitered terrain on enemy posts when scattered resistance would have been overcome by the bold infiltration of the reconnaissance echelons.

This lack of boldness is merely the outcome of the exaggerated spirit of prudence acquired as the result of the severe experience of fire during four and a half years of war.

If in 1914 there was a tendency to consider fire-power lightly, in 1934 there is a tendency to allow fire-power to become an obsession. Both tendencies are equally dangerous in their effects upon the education of the infantry.

The men must not be haunted by the idea of fire-power; they must have an exact idea of its value.

This exact idea of the value of fire-power must govern the prudence with which a commander, even one bold in the conception of his plans, must direct their execution.

Just how far must the spirit of prudence go, without risking it being converted into timidity, irresoluteness, faint-heartedness?

While in the attack—a brutal action in itself with clearly defined phases—the spirit of prudence must be dominant in the preparation thereof, and boldness should prevail after H hour, the same does not apply in an approach march or in the gaining of contact which are less clearly defined actions. However, one can define the spirit of prudence in these two domains as follows:

In an approach march within proximity of the enemy, due consideration will be given to prudence by taking the proper means of protection, by deploying units and using as extensively as possible the road system and echeloning them in depth, and by proper observation. Such consideration will be excessive if the march is organized, with all sorts of precautions, prohibitions, recommendations, resulting in the advance guards being held up and marking time.

In gaining contact, prudence demands similar precautions in regard to the protection and deployment of units; bounds with halts, close observation. However, it will be excessive if the mission of the reconnaissance elements is completely overshadowed by the sole endeavor to seek concealment and the reflex of halting at the first shot fired.

* * * * * * *

In conclusion:

First of all one must give anew to the infantry, together with the proper value of fire-power, the proper value of movement.

It is a problem of the happy medium, hence, delicate and difficult.

Without neglecting fire-power, the idea of infiltration, ability to take advantage of terrain features, and sections devoid of fire support, should be cultivated to a greater extent than has been the case in recent years.

For this purpose combat exercises on a larger scale than heretofore should be practiced, the scope of which having been too limited in the past and having been confined to a single method of command and action, restricted and rigid and not affording sufficient occasion for the troops to display initiative and to practice infiltration and maneuvering.

The practice of approach marches over long distances, without contact with the enemy, using to the utmost the road system, and the practice of the gaining of contact in which the enemy's resistance, echeloned in great depth, is not multiplied to the point of preventing all infiltration or maneuvering—as has often been noted—will, according to the French, contribute to bringing about the aim one wishes to attain, namely to give anew to units the idea of movement forward and hence greater speed.

Furthermore, anything which will give greater flexibility will contribute to the bringing about these results:* exercises of small detachments in the course of which unexpected incidents will arise; practice of very varied terrain, especially in cadre exercises where horse and bicycle make it easier to go beyond the usual terrain near garrisons; frequent practical exercises in open country, instead of close-order exercises and the limited distances of exercise grounds.

Finally, to arrive at the result sought, troops must:

(1) Suppress in written orders everything which slows down, everything which holds back uselessly, everything that limits initiative (lengthy orders, infringement upon the prerogatives of subordinates in the execution of their mission,

*It will be noted that in the future, with modern mechanized weapons, it will be just as necessary, if not more so, for the infantry to be alert and capable of maneuvering.

or when at a distance from the enemy the practice of requirements which are necessary only when contact has been gained).

(2) During approach marches, display a constant desire to secure information and for that purpose move about frequently.

(3) By an active and flexible mind, endeavor to get the best of an enemy. In the last analysis such a mind is the best guarantee of the rapidity of a maneuver.

(4) Educate the soldier to be bold, by showing him the advantages of his boldness in view of the prudent precautions taken by his leader.

These will be the prerequisites for our infantry—today a good fire-power infantry—to become anew a good mobile infantry.

The shoal to be avoided, as the war recedes in the background, will be the plunging head foremost into movement, forgetting the great 1914-1918 lessons of fire-power. Today the question is for infantry to become anew flexible, rapid, maneuverable and spirited without overlooking the stern lessons of fire.

Only on actual facts can anything enduring be built; alone they afford protection against abstract theory and the exaggerations of the imagination.

Section 3

DIRECTORY OF PERIODICALS

Included in this directory are only those periodicals from which articles have been selected.

See also, Section 7, "List of Periodicals Indexed and Key to Abbreviations."

MILITARY AND NAVAL PERIODICALS

Joint Forces

Army and Navy Journal 111
Army and Navy Register 112
Army, Navy and Air Force Gazette (Great Britain) 113
Fighting Forces (Great Britain) 121
Journal of the Royal United Service Institution (Great Britain) 122
Journal of the United Service Institution of India (Great Britain—India) 122
Revista del Ejercito y de la Marina (Mexico) 142

General Military

Army Quarterly (Great Britain) 114
Bulletin Belge des Sciences Militaires (Belgium) 115
Canadian Defense Quarterly (Canada) 119
Militärwissenschaftliche Mitteilungen (Austria) 123
Militär-Wochenblatt (Germany) 124
Nazione Militare (Italy) 139
Revue Militaire Francaise (France) 159
Revue Militaire Suisse (Switzerland) 162
Sanct Christophorus (Germany) 167
Wissen und Wehr (Germany) 174

Arms and Services

Air Arm

Revue de l'Armée de l'Air (France) 143
Royal Air Force Quarterly (Great Britain) 166

Artillery

Coast Artillery Journal 120
Field Artillery Journal 121
Journal of the Royal Artillery (Great Britain) 122
Revue d'Artillerie (France) 145
Rivista di Artiglieria e Genio (Italy) 164
Wehrtechnische Monatshefte (Germany) 172

Cavalry

Cavalry Journal 119
Cavalry Journal (Great Britain) 120
Revue de Cavalerie (France) 147

CHEMICAL

Chemical Warfare Bulletin....120

ENGINEERS

Military Engineer....138
Pioniere (Germany)....140
Revue du Génie Militaire (France)....157
Rivista di Artiglieria e Genio (Italy)....164
Royal Engineers Journal (Great Britain)....166

INFANTRY

Infantry Journal....121
Revue d'Infanterie (France)....149

MEDICAL

Army Medical Bulletin....113
Military Surgeon....138

ORDNANCE

Army Ordnance....114

QUARTERMASTER

Quartermaster Review....142

SIGNALS

Signal Corps Bulletin....172

TANKS

Royal Tank Corps Journal (Great Britain)....167

Navy and Marines

Marine Corps Gazette....122
Naval Institute Proceedings....139

GENERAL PERIODICALS

Foreign Affairs....175
Foreign Policy Reports....175
Round Table (Great Britain)....176

Section 4

CATALOG OF SELECTED PERIODICAL ARTICLES

This section catalogs the articles selected from Library periodicals for the current quarter. Periodicals in this Catalog are arranged alphabetically.

ARMY AND NAVY JOURNAL

3 August 1935

(1) ARMY PROMOTION BILL SIGNED, EFFECTIVE AUGUST 1
(2) PASS NAVY STAFF BILL; BOARDS TO BE CONVENED
(3) FOURTH ARMY MANEUVERS

10 August 1935

(4) SPEED ARMY MACHINERY TO EFFECT PROMOTIONS
(5) FIRST ARMY MANEUVERS

17 August 1935

(6) TROOPS GATHER FOR FIRST ARMY MANEUVERS
(7) SENATE CONFIRMS 4,454 NEW ARMY PROMOTIONS

24 August 1935

(8) BOARDS TO SELECT NAVY STAFF OFFICERS NAMED
(9) THE 28TH DIVISION. Major General Shannon

31 August 1935

(10) LESSONS OF MANEUVERS DISCUSSED AT CRITIQUE
(11) ACTIVE DUTY FOR RESERVES
(12) FOURTH ARMY CPX

7 September 1935

(13) DSM CLUSTER AWARDED TO GENERAL MACARTHUR
(14) EDITORS COMMENT ON LESSONS LEARNED FROM FIRST ARMY FIELD MANEUVERS
(15) ARMY MANEUVERS' LESSONS

14 September 1935

(16) FOURTH ARMY HOLDS CPX
(17) AWARDS MADE OF 1936 NAVY BUILDING PROGRAM

21 September 1935

(18) PHILIPPINE TASK GIVEN TO GENERAL MACARTHUR
(19) FOURTH ARMY EXERCISE OPPOSES COAST LANDING
(20) THE AIR FORCE IN THE MANEUVERS

28 September 1935

(21) PLAN FOR ARMY GIVEN BY GENERAL MACARTHUR
(22) COAST GUARD PROBLEM

5 October 1935

(23) GENERAL MALIN CRAIG NAMED CHIEF OF STAFF
(24) MOBILIZATION LAG CITED AS DEFENSE WEAKNESS
(25) GENERAL MACARTHUR TELLS OF RECENTLY AUTHORIZED IMPROVEMENTS IN ARMY

12 October 1935

(26) ARMY WAR COLLEGE POLICY
(27) AIR LESSONS OF MANEUVERS
(28) GENERAL MACARTHUR OUTLINES "GUIDEPOSTS IN ARMY'S FUTURE PROGRESS"

19 October 1935

(29) NAVY'S LIGHTER-THAN-AIR PROGRAM AWAITS REPORT
(30) LESSONS OF THE FOURTH ARMY CPX

26 October 1935

(31) LITTLE HOPE SEEN FOR NEW ARMS CONFERENCE
(32) ARMY RULINGS GIVEN IN DOUBTFUL PROMOTIONS

ARMY AND NAVY REGISTER

3 August 1935

(1) ARMY PROMOTION
(2) NAVY STAFF CORPS SELECTION
(3) RANK FOR ARMY COMMANDERS OPPOSED
(4) ADVANCEMENT ON RETIRED LIST
(5) VIRTUES OF THE C.M.T.C.

10 August 1935

(6) ACTIVE DUTY FOR RESERVE OFFICERS
(7) INCREASE OF ARMY PERSONNEL
(8) CCC ENROLLMENT CHANGED
(9) "RESTRICTED" ARMY PROJECTS
(10) ETHIOPIA'S TACTICS

17 August 1935

(11) THOMASON BILL REPORTED
(12) ARMY OFFICERS PROMOTED

24 August 1935

(13) REGULATING DUTY IN THIS CITY
(14) FIRST ARMY MANEUVERS

31 August 1935

(15) INFANTRY MODERNIZES
(16) AIRCRAFT PROCUREMENT POLICY
(17) WAR DEPARTMENT RADIO EQUIPMENT
(18) THE FIRST ARMY MANEUVERS

7 September 1935

(19) FREEDOM OF SPEECH
(20) THE NEUTRALITY LAW
(21) INFORMATION AND COMMUNICATIONS

14 September 1935

(22) NAVY SHIP CONSTRUCTION
(23) N.G. AND O.R.C. OFFICER STUDENTS

21 September 1935

(24) ARMY RETIREMENT LAWS
(25) ADVANCED RANK UPON RETIREMENT
(26) NATIONAL DEFENSE
(27) INCREASED RANK FOR RETIRED SOLDIERS

28 September 1935

(28) CHIEF OF STAFF'S REPORT

5 October 1935

(29) ARMY PROMOTION LIST CHANGES
(30) ARMY CHIEF OF STAFF
(31) FOURTH ARMY COMMAND EXERCISES

12 October 1935

(32) GENERAL OFFICER VACANCIES
(33) OUR NAVAL POLICY
(34) BATTLE OF ADOWA

19 October 1935

(35) NAVAL SHIPS COMPLEMENT
(36) SAFETY FOR THE C.C.C.

26 October 1935

(37) PAY AND ALLOWANCES
(38) NATIONAL DEFENSE. Rear Admiral Woodward
(39) "AS OTHERS SEE US"
(40) PANAMA DEPARTMENT LIBEL CASE

ARMY MEDICAL BULLETIN

July 1935

(1) THE FLIGHT SURGEON. Major Myers
(2) RESEARCH IN AVIATION MEDICINE. Major Grow
(3) THE INFANTRY DIVISION: ORGANIZATION AND MEDICAL SERVICE

ARMY, NAVY AND AIR FORCE GAZETTE (Great Britain)

11 July 1935

(1) MINISTERS AND COMMITTEES ON SERVICE CO-ORDINATION—II. THE WEIR COMMITTEE'S SCOPE AND FINDINGS. Captain Kennedy
(2) CONSCRIPTION IN IRAQ. By "Saracen"

18 July 1935

(3) MINISTERS & COMMITTEES ON SERVICE CO-ORDINATION—III. THE SALISBURY COMMITTEE DID NOT FEEL COMPETENT. Captain Kennedy

25 July 1935

(4) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—I. Major-General Rowan-Robinson
(5) THE CONQUEST OF ABYSSINIA. (Contributed)

1 August 1935

(6) THE FUTURE OF NAVAL LIMITATION. By "Navalis"
(7) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—II. Major-General Rowan-Robinson

8 August 1935

(8) ANTI-GAS ARMOUR. Major Murphy
(9) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—III. Major-General Rowan-Robinson

18 August 1935

(10) MAKING MOBILE INFANTRY. Captain Tuke
(11) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—IV. Major-General Rowan-Robinson

22 August 1935

(12) WITH THE RED ARMY. Brown
(13) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—V. Major-General Rowan-Robinson

29 August 1935

(14) TWO CAMPAIGNS IN ABYSSINIA. A CONTRAST AND A FORECAST. Captain Tuke

5 September 1935

(15) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—VI. Major-General Rowan-Robinson
(16) MECHANISATION REQUIRES MODERN MAINTENANCE METHODS. Brett

12 September 1935

(17) MAPS FOR TRAINING. (Contributed)
(18) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—VII. Major-General Rowan-Robinson
(19) GERMAN MANOEUVRES, 1935

19 September 1935

(20) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—VIII. Major-General Rowan-Robinson
(21) THE ALDERSHOT COMMAND AND THE INFANTRY-TANK. Captain Kennedy

26 September 1935

(22) ARMY MANOEUVRES, 1935. Captain Kennedy
(23) THE INFANTRY TANK. Major-General Fuller
(24) GALLIPOLI: THE LESSON OF CONTROL.—I Major-General Rowan-Robinson

3 October 1935

(25) GALLIPOLI: THE LESSON OF CONTROL.—II Major-General Rowan-Robinson
(26) GAS IN ABYSSINIA. Major Murphy
(27) ITALY AND THE MINERAL SANCTION. Sir Thomas Holland
(28) MUSSOLINI'S VIEWS ON ABYSSINIA

10 October 1935

(29) OUR ARTILLERY RACKET. By Mechanised Gunner
(30) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—IX. Major-General Rowan-Robinson

17 October 1935

(31) GERMANY, LITHUANIA AND MEMEL. Sir Alexander Lawrence
(32) BRINGING THE BOMBERS HOME. RADIO AIDS TO ACCURATE PILOTING. Flying Officer Dunworth
(33) THE CAMPAIGN IN MESOPOTAMIA: BAGHDAD & AFTER—X. Major-General Rowan-Robinson

ARMY ORDNANCE

July-August 1935

(1) PLANS FOR AN UNPLANNED CONFLICT. Scott
(2) BEHIND THE PARIS GUN. Miller
(3) IS WAR MORE HORRIBLE? PHYSICALLY—NO; PSYCHOLOGICALLY—YES. Major General Fuller
(4) MECHANIZED FORCES. A STUDY OF SUPPLY AND EVACUATION. (II) Captain Christmas
(5) INCREASED REVOLVER POWER. THE NEW .357 MAGNUM GUN AND CARTRIDGE. Sharpe
(6) THE WASHINGTON ARSENAL. HISTORIC LANDMARK OF THE NATION'S CAPITAL. O'Brien
(7) OUR STRONGEST GUARANTY OF PEACE. An editorial

ARMY QUARTERLY (Great Britain)

October 1935

(1) BYNG OF VIMY: AN APPRECIATION. Lieut.-General Vaughan
(2) MARSHAL PILSUDSKI
(3) THE FRENCH OFFICIAL HISTORY: THE AUTUMN OF 1914
(4) A MIGHT-HAVE-BEEN OF THE GREAT WAR IN 1914. Major-General Bird
(5) THE CRUSADE OF EDWARD I. Professor Kerr
(6) THE ITALIAN OFFICIAL HISTORY: VOLUME VIII, TOMO I.
(7) THE LAWLESS ARM. Spaight
(8) MONT ST. QUENTIN: SOME ASPECTS OF THE OPERATIONS OF THE 2ND AUSTRALIAN DIVISION FROM THE 27TH OF AUGUST TO THE 2ND OF SEPTEMBER, 1918. Colonel Durrant

(9) OPERATION ORDER NO. 24, 13TH OF SEPTEMBER, 1914; A CRITICAL STUDY. Captain and Brevet-Major Briggs

(10) THE OFFICERS' TRAINING CORPS: ITS FUNCTIONS AND ITS CRITICS. Lieut.-Colonel Seton Hutchison

(11) ORDER WRITING IN THE FIELD. Major Macleod

(12) THE ARMY OF TO-DAY. Captain Telfer

BULLETIN BELGE DES SCIENCES MILITAIRES (Belgium)

By Lieutenant R.E. Moore, Infantry

April 1935

(1) PAGES D'HISTOIRE DE L'ARMÉE BELGE AU COURS DE LA GUERRE 1914-1918.—LE COMBAT DE BEERST-BLOOTE. [History of the Belgian Army in the World War.—The battle of Beerst-Bloote.] (I) Lieutenant Velge

(2) LIAISON INFANTERIE-ARTILLERIE DANS LA PROGRESSION DE L'ATTAQUE. [Infantry-artillery liaison during the progression of the attack.] Lieut. General Grade

Infantry-artillery liaison exercises are divided into two phases: First, considering the conception of the operation by the regimental commander, he must imagine a situation in which the battalion commander will necessarily have to ask for the help of the artillery, and he must make a decision based on the information given him by the battalion commander. Second, considering the execution of the operations the points to be considered are:

(a) The automatic weapons—their field of fire, an exact report of their positions and control of their fire.
(b) The nature of the request for artillery help.
(c) The decision of the regimental commander.
(d) Dispositions of the battalions.

All unit commanders should be generally familiar with the plan of maneuver. The Corps commander designates the general plan, the division commanders outline their plans of maneuver, basing their decisions on the plan of the Corps and so on down to include the company and platoon. Each unit commander keeps in mind always the plan of maneuver of the next higher unit and makes his decisions accordingly. For all small units the plan of maneuver should be to combine fire and movement in taking successive objectives laid down by the next higher command. For these small units, the problem is simple: to gain ground in a given direction. But it is up to the higher unit commanders to coordinate the actions of the lower units. They can do this by using their reserves and their brains.

The question arises: "Who has the right to ask for the help of the artillery?" In a defensive situation, the battalion commander or even the company commander may sometimes call on the artillery. However, in an offensive maneuver, this power lies only with the regimental commander.

The author next discusses in some detail the three problems which always confront the infantry in asking for artillery aid:

(a) The problem of discovering the objective on the ground.
(b) The problem of putting it on a map or overlay as well as the position of the infantry front lines.
(c) The problem of designating it to the artillery.

(3) LES FORMATIONS DE MOTOCYCLISTES EN ALLEMAGNE. [The formations of motorcyclists in Germany.] Lieutenant Dinjeart

The organization of the Reichswehr provides for an Automobile Transportation Corps for each division. However, the Germans try to avoid manufacturing many automobiles in time of peace which will not only be obsolete in time of war, but which cost the government much money to build. They have so organized the nation that they can secure all the private automobiles they need in time of emergency and have, in various other ways provided for mobility of the army without violating the Treaty of Peace.

Regarding the company of machine-gun motorcyclists, its organization consists of:

Company Headquarters
3 platoons of light machine guns of 3 combat groups each
A section of 4 heavy machine guns.

Each platoon is comprised of:

A liaison group
3 combat groups of 12 men each
18 motorcycles.

The section of heavy machine guns is composed of one officer and about 25 men and 4 heavy (Maxim) machine guns. The machine guns and ammunition are carried on trailers while the personnel is transported in side cars. This section also has automobile transportation as follows:

4 passenger cars of which one is built to traverse any kind of terrain and is used by the company commander
6 trucks for the supply of food, matériel, fuel and baggage
2 signal cars.

All of the men in the company except the machine gunners are armed with the rifle. Each carries 60 rounds in his cartridge belt.

The light machine gun mentioned above is the model 1930 gun used by both the infantry and the cavalry. It weighs about 17 pounds, considerably less than the 32-pound light machine gun used during the War. The difference in weight is largely due to the fact that the new gun is air cooled. It has a muzzle velocity of 750 yards, its rate of fire is 600 shots per minute, capacity, 25 cartridges, range, 2,000 yards. It can be fired from the side car either while moving or when stopped and has a special sight which enables it to be used against aircraft. The heavy machine gun differs in that it must be removed from the trailer before it can be fired.

The drivers are protected by a special hood, and wear either the steel helmet or the motorcycle helmet. All men carry only what is necessary in combat, that is, the rifle and cartridge belt.

The motorcycles are of a commercial type, not weighing more than 600 pounds, air cooled, provided with electric lights and two seats. Some models have the body and the exhaust pipe elevated to facilitate their mobility across bad terrain.

The trailer which carries the heavy machine gun is mounted on 2 rubber-tired wheels. Its maximum load is 440 pounds. The motorcycles can be equipped with silencers. These are particularly useful when in the proximity of the enemy. A trained man can attach the silencer in about 7 minutes. Some even had shock absorbers to make traveling easier across rough country. The motorcycle communication platoon is organized as follows:

2 officers
23 enlisted men
1 passenger car
1 truck
19 motorcycles.

The principle advantage of the machine-gun motorcycle is that it can carry a great deal of fire-power a long distance. The Germans state that trained units can cover daily a distance of from 125 to 225 miles at an average speed of about 20 miles per hour. However, they must stop every 75 miles to refuel. Their worst enemy is the antitank cannon. However, they can lessen this danger by abandoning the roads and traveling cross country. Due to their speed, enemy aviation will not be much of a menace.

The two general missions of motorcycle units in time of war will be those of reconnaissance and combat. In reconnaissance, they will operate at great distances from their own troops and in direct liaison with the air corps. In battle, due to their great speed, they can be advantageously employed against the flanks and rear of an adversary. In case of a motor-

ized attack, the motorcycle will be in the first echelon where it can best discover or create openings for the larger vehicles to penetrate.

Besides the two general missions of reconnaissance and combat, there are several special missions for which the motorcycle may be used:

It may be used in the pursuit or in the retreat while fighting a delaying action.

It may have the mission of protecting motor columns. In fact, they are the only units capable of properly performing this delicate mission.

It may be used to provide protection for columns on the march, and to open up defiles or to close defiles and to put up delaying obstacles.

The author gives an example of how a motorcycle unit, acting as a point for a column, would protect it against an attack by armored cars.

The motorcyclists would take to cover with their machines, leaving a field of fire for the machine guns. They would lay down a protecting smoke screen on the road to screen their movements and hurriedly plant mines in the road.

The remainder of the article deals with the three automobile and motorcycle clubs that have been organized by Hitler throughout Germany for the training of the citizenry in the tactical use of these machines during war.

(4) IDÉES ACTUELLES SUR L'AVIATION DE CHASSE. [Current ideas on pursuit aviation.] Colonel Desmet

When the World War broke out in 1914, none of the participants had a particular type of airplane for a particular mission. If they wished to drop bombs, they dropped them from any type of airplane by hand. Soon, however, military airplanes began to be classified according to their missions. Among these classifications was that of pursuit. In this article, Colonel Desmet shows that pursuit aviation is being still further divided or classified according to its mission. For some missions assigned to the pursuit airplane, the single seater is most effective; for others the two-seater or three-seater can perform the job better. He discusses the advantages and disadvantages of each, the relative merits of various types of armament and last of all, gives a short discussion of combat tactics.

(5) UNE LEVÉE DE CANDIDATS SOUS-LIEUTENANTS EN 1813. LES GARDES D'HONNEUR. [A levying of sub-lieutenant candidates in 1813. The Guards of Honor.] (II) Major Couvreur

An account of the campaigns participated in by the young men of Napoleon's Guards of Honor. This second article deals with the campaign of France and that of Anvers and Mayence.

May 1935

(6) PAGES D'HISTOIRE DE L'ARMÉE BELGE AU COURS DE LA GUERRE 1914-1918: LE COMBAT DE BEERST-BLOOTE. [History of the Belgian Army in the World War. The battle of Beerst-Bloote.] (II) Lieutenant Velge

(7) LE BARRAGE DE FEUX. [The barrage of fire.] Major General de Krahe

General de Krahe in this article attempts to clarify and amplify the regulations concerning barrages.

First, he names the weapons which take part in a barrage, namely, machine guns, machine rifles, rifle grenades, hand grenades, mortars, antitank guns and of course, the artillery. In short, all the weapons of the infantry have a part to play in a barrage, each weapon having a definite mission to perform.

Next, he discusses the limiting factors in a barrage. Leaving terrain out of the discussion, there are three factors which have a bearing on the success of a barrage. First, the effectiveness of the weapons used, that is, their best range, their rate of fire, etc.; second, the limits of security, and third the effect of surprise. Each of these factors is discussed in detail and accompanied by tables and diagrams.

(8) L'OBSERVATION À L'ARTILLERIE DU CORPS D'ARMÉE. [Artillery observation in the Army Corps.] Lieut.-Colonel Nonnon

In 1932 and 1933, Lieut.-Colonel Nonnon published some articles on this subject. Last March an article appeared in the "Bulletin Belge

des Sciences Militaires" by Captain Smesman, attacking Colonel Nonnon's ideas on artillery observation in the army corps. In this article Colonel Nonnon attempts once more to justify his ideas.

(9) LES LECONS DE L'INSTRUCTEUR D'INFANTERIE. [The lessons of the infantry instructor.] Lieut.-Colonel Bouha

The first thing an infantry soldier is taught when he is a recruit is close order drill. He is drilled as a part of a unit until he loses all sense of individualism. Then he is put through field problems where his every move is governed by the command of a leader. He is not trained to think for himself.

The author emphasizes the necessity for training the infantry soldier's mind as well as his body. Parade ground drill has its place and is a good means of instilling discipline in the soldier, but it should not be overemphasized. Infantry instructors too often forget that the ultimate end of the training of an infantry soldier is to teach him how to fight intelligently in time of war. In the confusion of battle, when he can not see the man on his right or left and can not hear the commands of his leader, when he is under fire and is continually looking to the front instead of to the rear at his leader, if he can not think for himself he is lost and useless. The best way to overcome this "automatic" training is by making the field problems more interesting and varied. Divide the troops into two sides and make the problem as realistic as possible. Hold a conference after each problem making the soldiers write down what they saw and did during the problem.

Colonel Bouha suggests that infantry training be divided into three parts: First, the technical, tactical and mental training of a soldier. Under the technical training he learns the use of his weapon and becomes interested in becoming proficient with it. Under his tactical training he learns to substitute thinking for memory, personal invention for strict application, and initiative for impulsion. As to his mental training or his morale, he should develop tenacity, the desire to fight and to kill and should overcome his fears.

The second part of infantry training should be individual tactical instruction during which the soldier learns how to take cover, to move under fire and to observe. The machine gunners and automatic riflemen are trained in the tactical use of their weapons.

The third part consists of group instruction for rifle grenadiers and machine gunners during the approach, the attack, the assault and the defense.

June 1935

(10) PAGES D'HISTOIRE DE L'ARMÉE BELGE AU COURS DE LA GUERRE 1914-1918.—QUELQUES SOUVENIRS DES DÉBUTS DE L'AÉRONAUTIQUE BELGE. [History of the Belgian Army in the World War.—Recollections of the beginning of Belgian aviation.] Lieut.Colonel Wahis

(11) LES TIRS D'ARRÊT. [Fire of concentration.] Major Sottiaux

The old system of a linear barrage laid down in front of a defensive position is no longer used except on rare occasions. The artillery assists the defending troops by laying down a dense and deep barrage in the places which cannot be covered by infantry fire or in front of the weak places in the defensive lines.

The author states the areas which can be effectively covered by the 75-mm. gun and by the 105-mm. and 155-mm. howitzers firing their maximum number of shots per minute.

There are two occasions where, instead of concentrating artillery fire in depth, it may be widened and used as a barrier to the advancing enemy infantry. The first is where it is impossible to determine in advance what specific objectives should be covered and the second is where it is impossible to assure observation and control of fire. Concentrated fire can only be used after careful reconnaissance.

In order to be most effective, concentrated fire should be laid down just as the enemy is approaching the first line of defense. This can be accomplished only by a rapid and sure system of signals. The use of the rocket still seems to be the surest and quickest way to transmit this informa-

tion. Rocket signals should, of course, be immediately supplemented by telephone or telegraph.

(12) LA GUERRE DE MINES SUR LE FRONT ANGLAIS. [Mine warfare on the British front.] Captain Misson

The question is often asked, "Will mine warfare be used in future wars?" From a study of the results obtained in the World War, the answer seems to be that mining will always be an important phase of warfare.

In 1914 things happened so suddenly that no one had time to think of mines.

In 1915 the Germans completed the first mine, the explosion of which came as a complete surprise to the British. In this same year, the British began to organize their mining units or "Tunneling Companies" as they called them. These companies were composed chiefly of men who had been employed in building the tunnel of Liverpool. Each company consisted of one major—company commander, one captain—adjutant, one medical officer, one geologist, four captains—chiefs of sections, and 350 troops. By June 1918, 35 such companies had been formed.

During 1915 many mines were dug but all of them without any single purpose in view. In 1916, the British created the "Service of Inspection and of Control of Mines," thus coordinating all mining activities, and on 6 June 1917 the war of mines was over, the British being the complete masters of the situation.

In conclusion, mine warfare was not a waste of time. It was used successfully to blow up enemy advance posts, observation posts, sections of trenches and always had a terrific effect on the morale of the enemy when one was set off. Mines may be used most effectively where the enemy emplacements are too close to our own lines to be shelled by the artillery. True, an enormous amount of explosive is needed to set off a mine and men are sometimes buried while mining, but neither the explosive nor the loss of lives can compare with the cost of the same result produced by an artillery barrage.

(13) L'ORGANISATION DES TRANSMISSIONS AU COURS DES OPÉRATIONS DANS LE RIF EN 1925 ET 1926. [The organization of communication during the operations in the Riff in 1925 and 1926.] Captain Montlibert

The author divides his article into five chapters: A detailed description of the theater of operations to orient the reader; the operations which took place in 1925; the work done by the communication troops in 1925; the operations in 1926 and the specific organization of communications in the Moroccan division in 1926. He concludes with some of the lessons learned from a study of these operations.

(14) LANGUAGE SECRET. [Codes.] Captain Flahaut

(15) PHILIPPEVILLE EN 1815. [Philippeville in 1815.] (I) Major Wodon

A description of the life and people of Philippeville at the time of Napoleon's return from Elba.

CANADIAN DEFENCE QUARTERLY (Canada)

October 1935

(1) BRITISH FOREIGN POLICY. (Editorial)

(2) CANADIANS IN BATTLE, 1915-1918. Colonel Duguid

(3) CANADA AND IMPERIAL DEFENCE

(4) THE CONQUEST OF THE ZONE OF THE CHINESE EASTERN RAILWAY. (II) Nikolaieff

(5) "BLIND FLYING." Flight Lieutenant Fullerton

CAVALRY JOURNAL

July-August 1935

(1) 6TH CAVALRY AT THE MANEUVERS OF THE 8TH BRIGADE. (I) Lieut.Colonel Edmunds

(2) ANTI-AIRCRAFT ACTION OF THE CAVALRY LIGHT MACHINE GUN. Lieutenant Corbett

(3) AN IMPROVED TYPE OF OFFICER'S SHELTER TENT. Captain Merrill
(4) THE CONCENTRATION OF THE 14TH CAVALRY. Captain Williamson
(5) PANAMA'S IRREGULAR CAVALRY. Captain Rose
(6) MODERN CAVALRY: TRAINING; GENERAL CONCLUSIONS. Generalleutnant Brandt, German Army
(7) MINUTE MEN OF THE NEXT WAR. Major General Hagood
(8) INFLUENCES OF MECHANIZATION, MOTORIZATION AND MACHINE GUNS ON THE HORSE CAVALRY REGIMENT'S TACTICS, ORGANIZATION AND SUPPLY METHODS. (VI) Colonel Martin

September-October 1935

(9) ONE HUNDRED AND THREE FIGHTS AND SCRIMMAGES. (I) Russel
(10) MOBILITY. Lieut. Colonel Wainwright
(11) 6TH CAVALRY AT THE MANEUVERS OF THE 8TH BRIGADE. (II) Lieut.Colonel Edmunds, and Captain Ramey
(12) TRAINING IN ATTACK METHODS FOR CAVALRY. Captain Yale
(13) THE BATTLE OF ADOWA. AN ACCOUNT OF THE HISTORICAL ITALO-ETHIOPIAN FIGHT OF 1896. Major Smith
(14) ARE MORE CHANGES NEEDED IN OUR HORSED CAVALRY REGIMENTS NOW? Colonel Scott
(15) FIELD EXERCISES OF THE 1ST SQUADRON, 3RD CAVALRY. Lieutenant Dalton
(16) DEATH! THEN WHAT? Captain Doherty

CAVALRY JOURNAL (Great Britain)

October 1935

(1) CAVALRY IN FRANCE, AUGUST-NOVEMBER 1918. Part VII. Lieut.-Colonel Preston
(2) THE YEOMANRY AT GAZA I (26TH MARCH, 1917). Major Teichman
(3) TWO CAVALRY RAIDS OF THE GREAT WAR. Part II. Major Sheppard
(4) OPERATIONS AGAINST THE NUBA GEBELS (17TH OCTOBER, 1917, TO 25TH JANUARY, 1918). Part III. Major Lamb
(5) USE OF THE SUN IN MAP-READING AND RECONNAISSANCE. Lieut.-Colonel Hutchison
(6) A DOUBT ABOUT NAPOLEON
(7) LAKE AND VICTORY. PART III. MONSON'S RETREAT. Colonel Maunsell

CHEMICAL WARFARE BULLETIN

July 1935

(1) MEDICINE AND CHEMISTRY; A MILITARY ALLIANCE. Major General Patterson
(2) SMOKE SCREENS VISIBLE OR INVISIBLE. Major Murphy
(3) FACTS AND FABLES. Kibler
(4) A PROPHET OF CHEMICAL WARFARE. Lieut.Colonel Grenouillet
(5) CHEMICAL INDUSTRY, WAR, AND DISARMAMENT. Major Sarver
(6) REALISTIC ARMY DEMONSTRATION
(7) DISTRIBUTION OF GAS MASKS TO CIVIL POPULATION ABROAD

COAST ARTILLERY JOURNAL

September-October 1935

(1) SOME FACTS ABOUT BOMBARDMENT AVIATION. Major Chennault
(2) WHO STARTED SUCH A MESS? Lieutenant Adams
(3) THE BATTLE OF ADOWA. Major Smith
(4) THE TANK JU-JU. Captain McGuire
(5) PRESS CENSORSHIP IN WAR TIME. PART II. Major Caygill
(6) INTERBATTERY COMMUNICATION BY RADIO. Major Conable
(7) DEATH! THEN WHAT? Captain Doherty
(8) SECRET CAUSES OF GERMAN SUCCESSES ON THE EASTERN FRONT. Nikolaieff

(9) MOTOR CONVOYS. Captain de Camp
(10) CHEMICAL SECURITY. PART III. Captain Waitt
(11) EFFICIENCY REPORTS. Lieut.Colonel Hughes

FIELD ARTILLERY JOURNAL

July-August 1935

(1) THE LIAISON PROBLEM. Major Wood
(2) ORGANIZATION, ARMAMENT, AMMUNITION AND AMMUNITION EXPENDITURES OF THE GERMAN FIELD ARTILLERY DURING THE WORLD WAR. Lieut.General Muther, Retired
(3) LUZON CANNONEERS. Captain Eckert
(4) AS TO ADVANCE GUARDS. Major Hildebrand
(5) THE DEVELOPMENT OF THE FIELD ARTILLERY RESERVE OFFICERS' TRAINING CORPS. Major Parker
(6) BATTLE TERRAIN DEPTH AND ARTILLERY
(7) THE MILLS OF NEERWINDEN. Pratt
(8) THE BEST RADIO WAVELENGTH FOR THE FIELD ARTILLERY. Lieutenant Wrockloff

September-October 1935

(9) THE BATTLE OF THE MEUSE RIVER. Colonel Lanza
(10) A SERMON ON THE "MOUNT." Lieut.Colonel Christian
(11) ARTILLERY AND CHEMICAL WARFARE. Captain Barker
(12) THE UTILITY OF RADIO-OPTICAL WAVES IN RADIO COMMUNICATION AND THEIR POSSIBLE FUTURE ADAPTATION TO THE COMMUNICATION AND FIRE DIRECTION SYSTEMS OF THE ARTILLERY BATTALION. Captain Chandler
(13) DEATH! THEN WHAT? Captain Doherty

FIGHTING FORCES (Great Britain)

August 1935

(1) A DEBATE ON DEFENCE. Admiral Keyes
(2) V.—GALLIPOLI: THE FIRST LANDING. Lieut.-Colonel Burne
(3) EUROPE IN PERIL. Carter
(4) THE SEDGEMOOR CAMPAIGN, 1685. Major Edwards

October 1935

(5) AN INTERNATIONAL AIR FORCE. By the Editor
(6) THE ARMY MANOEUVRES. By our Special Correspondent
(7) BACK TO SPICHEREN. Lieut.-Colonel Burne
(8) THE SHADOW OF ADOWA. Major Sheppard

INFANTRY JOURNAL

September-October 1935

(1) SOME FACTS ABOUT BOMBARDMENT AVIATION. Major Chennault
(2) WHO STARTED SUCH A MESS? Captain Adams
(3) THE TANK JU-JU. Captain McGuire
(4) THE HUMAN ELEMENT. Major General Croft
(5) THE BATTLE OF ADOWA. Major Smith
(6) PRACTICAL EMPLOYMENT OF FIELD ARTILLERY. Major Townsend
(7) DEATH! THEN WHAT? Captain Doherty
(8) CHEMICAL SECURITY—PART II. Captain Waitt
(9) SECRET CAUSES OF GERMAN SUCCESSES ON THE EASTERN FRONT. Nikolaieff
(10) THE LOST ART OF MANEUVER. Colonel Stilwell
(11) PRESS CENSORSHIP IN WAR TIME. PART II. Major Caygill
(12) WE WILL HAVE BETTER RESERVE OFFICERS. Major Drummond
(13) THE GUN PLANE. Captain Greene

JOURNAL OF THE ROYAL ARTILLERY (Great Britain)

October 1935

(1) "NOUS VERRONS." ["What changes in methods of attack on defended ports are likely to result from developments in ships and aircraft? What alterations in equipment and organization are necessary to enable the artillery of the defence to deal with such attacks?"] Lieutenant Nevill ("Duncan" Silver Medal Essay, 1934-35)
(2) SIMPLE SURVEY. Major Trappes-Lomax
(3) HISTORY—THE UNROLLED SCROLL OF PROPHECY, A REFLECTION ON "SOME CAVALRY ACTIONS AND TANK COMPARISONS." Major Waller
(4) THE ROYAL ARTILLERY IN CEYLON. Major Gill
(5) JAMES ON ARTILLERY—1810. By "Pollaniska"
(6) THE ROCK. Lieutenant Wolfe-Barry
(7) THE AIR ATTACK AGAINST EVEREST. Lieut.-Colonel Blacker

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION (Great Britain)

August 1935

(1) THE INFLUENCE OF SEA POWER ON BRITISH STRATEGY. Vice-Admiral Domvile
(2) WINGED ARMIES. Major Godfrey
(3) THE ARMY AND THE AIR. Captain MacGregor
(4) THE DEVELOPMENT OF THE AIRCRAFT CARRIER. Harper
(5) GERMANY'S AIR FORCE. Flying Officer Dunworth
(6) THE POTENTIALITIES OF TELEVISION FOR WARLIKE PURPOSES. Commander Slee
(7) THE ROYAL AIR FORCE IN THE FAR EAST. Group Captain Wright
(8) GAS WARFARE: ITS POTENTIALITIES AND LIMITATIONS. By "Respirator"
(9) SOVIET NAVAL DOCTRINE. White
(10) JAPAN'S FUEL OIL. Phayre
(11) ITALY AND ABYSSINIA

JOURNAL OF THE UNITED SERVICE INSTITUTION OF INDIA (Great Britain—India)

April 1935

(1) THE 'INTERNATIONAL SAAR FORCE, 1934-35. Lieut.-Colonel Kenchington
(2) INDUSTRIAL MOBILIZATION. Major-General Rowan-Robinson
(3) THE TRAINING OF A RAILWAY BATTALION OF THE AUXILIARY FORCE (INDIA). Lieutenant Hambly
(4) FOR WANT OF A NAIL. Major Woods

July 1935

(5) LYAUTEY, MOROCCO, AND THE N.W.F.P. By "Spingira"
(6) PROMOTION IN THE WAR BLOCK. Captain Creffield
(7) FOREST WARS. Captain Howman
(8) THE FOREIGN LEGION. Captain Codrington
(9) THE BATTLE OF SEDGEMOOR: ANOTHER VERSION. By "Hazara"
(10) THE FIRST BATTLE OF JABAL HAMRIN, MARCH 25TH, 1917; MESOPOTAMIAN CAMPAIGN. By "Scorpio"

MARINE CORPS GAZETTE

August 1935

(1) A REALIST LOOKS AT ETHIOPIA. Coon
(2) INDIRECT FIRE AT WATER-BORNE TARGETS. Lieutenant Letcher
(3) C O_2 M_2 E S_3. Lieut.Colonel Schmidt
(4) THE OLD BEAR OF THE NORTH. (II) Lieut.Commander Birkett

(5) WHY THE COMPLICATED ANTI-AIRCRAFT DIRECTOR? Captain Roberts
(6) FIELD MAPPING. Captain Kenyon
(7) DO WE NEED ARTILLERY IN SMALL WARS? Lieut.Colonel Jacobson
(8) DIPLOMATIC SPURS. OUR EXPERIENCES IN SANTO DOMINGO. Lieut.Colonel Miller

MILITARWISSENSCHAFTLICHE MITTEILUNGEN (Austria)

By Major F. During, Infantry

April 1935

(1) ENTSTEHUNGSGESCHICHTLICHES ZUR NEUUNIFORMIERUNG DES BUNDESHEERES. [The new uniforms of the Austrian Army from an historical point of view.] Lieut.Colonel Petzelt

(2) DIE STRATEGISCHEN PROBLEME IM MITTELMEER. [Naval strategical problems in the Mediterranean.] Naval Lieutenant Sokol, Retired

The author analyzes in turn the positions and requirements of the Mediterranean Powers, i.e., those nations which border on that sea, and also those other nations whose interests lie thereon. He then reduces these Powers to three, viz., Great Britain, France and Italy, and of these he points out the widely differing nature and degrees of their dependence on the Mediterranean. "England's position resembles a series of fortified posts in a territory which is not unconditionally subject nor reliable, and yet the possession of which is necessary for the life of the mother-country." Nor are the ends of this "territory" secure, as the passage of the Straits of Gibraltar by German submarines, and the Turkish attack on the Suez Canal proved. Further, in these days of aviation and of submarines, even allowing for the fact that improved possibilities of observation will tend to cause the last-mentioned to transfer their activities from enclosed waters to the high seas, England's position in the Mediterranean has lost in value. "In order to play an active part in the Mediterranean England must have a close confederation with either France or Italy." The recent political rapprochement between France and Italy might, therefore, if honorably and logically furthered, bring about a new chapter in the history of the nations interested in the Mediterranean. "But hard facts cannot be gotten rid of by passing attempts at reconciliation. When matters become serious it is as little to be expected that France will give way without fighting as that Italy will give up her claims."

(3) RUSZLANDS RÜSTUNG. [Russia's armament.] General Schilhawsky

May 1935

(4) VOR ZWANZIG JAHREN. DIE KRIEGSPLÄNE DER MITTELMÄCHTE. [Twenty years ago. The war plans of the Central Powers.] Major General Steinitz

This article deals with the conversations and correspondence in the spring of 1915 between Generals von Falkenhayn and Conrad von Hötzendorf, the Chiefs of Staff at German General Headquarters and at Austro-Hungarian General Headquarters, respectively, and rough sketches make clear the nature of proposal and counter-proposal. The plans mentioned are those which were connected with the combined offensive at that time in progress against the Russians in Galicia, which was meeting with success; with the attitude of the Central Powers toward Serbia, where the Austrians were for the defensive, while Falkenhayn wanted them to attack; and with what was to be done in the event of Italy declaring war, which she presently did. The two Chiefs seldom saw eye to eye, and if Conrad, in the opinion of his German colleague, insisted too much on the Italian danger, the cautiousness of Cadorna's advance, even if foreseen, could hardly be banked upon. The only safe assumption was that the Italians would use their great numerical superiority (8 to 1) in an energetic thrust on Vienna, a thrust which would have the advantage of bringing the Serbian army into cooperation with them on their right. General von Steinitz thinks it was lucky for Germany and Austria that the Entente had no Napoleon in command when Italy declared war, for the Central Powers would then have been brought to their knees in a few weeks.

A consideration of the sketch-map of Europe showing the four theaters of war with the comparative strengths of the opposing forces lends color to this view. In France, in Poland and in the Balkans the numbers on each side were approximately equal: on the frontier of the Tyrol and Carinthia 100,500 men are shown as having opposite them 875,000.

(5) DIE UMBEWAFFNUNG DER SCHWEIZER ARTILLERIE. [The re-armament of the Swiss artillery.] Major General Rieder

MILITAR-WOCHENBLATT (Germany)

By Major G.J. Braun, Infantry

25 March 1935

(1) AUS GROSZER ZEIT. DIE MÄRZ-OFFENSIVE 1918 UNTER ENGLISCHER BETRACHTUNG. [The March offensive, 1918.]

The author discusses the British official "History of the Great War"; compiled by Brigadier-General Sir James E. Edmonds. According to the author the main lesson derived from reading the book, is that leaders, after committing their respective reserves, cannot influence the progress of the battle to any extent. Yet, even if reverses are met, an iron-willed leader can still divert the outcome of a battle, for "a lost battle is often a battle which is believed to be lost."

(2) PSYCHOLOGIE ALS HILFSWISSENSCHAFT FÜR KRIEGSGESCHICHTSSCHREIBUNG UND HEERFÜHRUNG. [Psychology as an aid to historians and leaders.] Lieut.Colonel Müller Loebnitz

(3) DIE AUFGABEN UNSERER KRIEGSGESCHICHTLICHEN FORSCHUNG. [The problems of historical research.] Major Badinski

The author warns officers who undertake research work to bring out the actual happenings of certain battles or campaigns in order to bring out lessons and not for the purpose of criticizing. The best way to learn from a battle is not "how it should have been fought, but how it was actually fought."

(4) WAFFENGATTUNGEN IM ZUKUNFTSKRIEG. [Combined arms in a future war.] Captain Wagner

The author recommends the organization of (a) Attack or breakthrough troops, consisting of mechanized divisions, including artillery of all calibers. (b) Enveloping or fast troops, consisting of mechanized divisions, having regiments of machine guns and light artillery. These divisions should also be used for delaying action and pursuit. (c) Defense troops, consisting of the old infantry division, i.e., infantry armed only with the rifle, regiment of machine guns, engineers to prepare obstacles and heavy far-reaching artillery. In this group the mass of the army should be found. Auxiliary troops should consist of communication, engineers, and reconnaissance troops.

(5) ITALIENS VORGEHEN GEGEN ABESSINIEN. [Italy's action against Abyssinia.]

(6) TAKTISCHE AUFGABE NR. 7. [Tactical Map Problem No. 7.] Requirements and decision.

4 April 1935

(7) LUDENDORFF. ZUM 70. GEBURSTAGE AM 9. APRIL 1935. [Ludendorff (on his seventieth birthday, 9 April 1935).] General Wetzell, Retired

A complimentary review of the life of Ludendorff in war and in peace.

(8) KÖNIGSBERG—DIE SCHMIEDE DER DEUTSCHEN WEHRKRAFT NACH DEM ZUSAMMENBRUCH VON 1806/07. [Königsberg—the rehabilitation of the German military strength after the collapse of 1806-07.] Major General Klingbeil, Retired

(9) KANN DIE GESCHWINDIGKEIT MODERNER REITEREI GESTEIGERT WERDEN? [Can the speed of modern cavalry be increased?]

The author defends the right of cavalry and mounted units to exist in this modern mechanically-minded day. Quoting General von Poseck, he states that even though the mechanical units will excel the mounted units on the march and in speed on hard roads, it is the reverse on the battlefield when horse-drawn and mounted units possess greater tactical

mobility. He also stresses the fact that the real test for combat readiness comes not while troops are on metallic roads but after leaving same. Here the horse is supreme.

The author admits that the cavalry is not faster than infantry on the march. He mentions the following factors as causing loss of time and slowing down cavalry action: (a) delay in issuing combat orders; (b) slow schematic procedure in building up a battle; (c) the decided temerity in utilizing the horse in battle.

Finally he states that the majority of troops utilize faster mechanical transport equipment than afforded the cavalry, therefore the greater speed; but that the motorizing of cavalry has increased its speed and mobility and provides an extremely useful and effective weapon for the army commander.

(10) LETTOW-VORBECK, EIN VORBILDLICHER HELD! URTEIL EINES RITTERLICHEN GEGNERS, DES FRANZÖSISCHEN OBERSTEN CHARBONNEAU. [v.Lettow-Vorbeck, an outstanding hero. The estimate of an honorable opponent by the French Colonel Charbonneau.] Bischlager

An interesting appreciation of character and ability of v.Lettow-Vorbeck, the German hero of the German East African campaign. Coming from so prominent an opponent this article is an outstanding example of admiration of one soldier for the deeds performed by another even though an erstwhile enemy.

(11) SOLLEN KRIEGSERFAHRUNGEN VERGEHEN? [Should war experiences be forgotten?] Major Buhle, Retired

The author expresses the opinion that actual war experiences provide marvelously interesting reading and instruction to the soldier, and requests that all those who had combat service and are capable of writing, should record their experiences for instructional purposes.

(12) EIN NEUZEITLICHER DSCHINGIS-KHAN. [The modern Genghis-Khan.] (I) (See abstract, page 72)

(13) DAS WESEN DER WEHRWIRTSCHAFT. [The conduct of war industries.]

The article considers a healthy peace industry to be the best industrial preparation for war. It states that those who know the conditions of war industry realize that the strength of the armed forces of a nation depends on its war industries and consider both are equal in importance.

(14) DIE RÜSTUNG DER WELT. [World armament.]

The anonymous critic calls attention to the rearming of nations, as can be seen in v.Loebell's Year-Book, as the cause of Germany's arming.

(15) TAKTISCHE AUFGABE NR. 7. [Tactical Map Problem No. 7.]

This contains a suggested solution to the problem.

11 April 1935

(16) EIN BLICK IN DIE ZUKUNFTSKRIEGFÜHRUNG. [Future combat leadership.] General Wetzell, Retired

The author recalls that the last war gave birth to many new innovations to the art of war. Land warfare saw the introduction of gas, tanks and motorized conveyances; on the sea, the war changed from the surface to the submarine; and in the air the lighter and heavier aircraft became a potent weapon. Last but not least, the propaganda war was extremely effective in the rear areas on allies and neutrals.

The tank, with its far-reaching possibilities in wars of the future, is given much space in current military literature by all nations. Some authors, such as General Fuller with his collaborator Liddell-Hart, have contributed much relative to the shock action of the tank and in some respects seem to have allowed their prophecies of the future possibilities of tanks to go beyond reasonable bounds. History demonstrates that counterweapons are developed to give these new dangerous weapons a vulnerability which diminishes their military threat. General Eimannsberger, the Austrian writer, has analyzed all World War tank attacks and deducted the reasons for their failures or successes and expressed logical opinions as to their future use.

The author practically quotes in toto an article by General von Eimannsberger, "Questions on the Use of Artillery," which appeared in "Militärwissenschaftliche Mitteilungen" of January 1935. [See RML No. 56 (March 1935), page 157]

(17) PROPAGANDA—EINE KRIEGSWAFFE! [Propaganda—a military weapon!]

The hostile propaganda against everything German started several years before the War. During the first year of the war Germany was not fully aware of the dangers of propaganda. People were surprised and shocked to read apparently impossible statements and lies that were printed or rumored and passed these off with the expression "Now who could believe this!" Hindenberg and Ludendorff observed this danger and took steps to counteract it. This action was too late in the neutral countries as their minds had been poisoned. Germany's efforts at propaganda only furnished additional material for the enemy, it having been started too late.

After accomplishing its mission in the neutral countries and in the homeland, the allied propaganda logically started in Germany itself. It was so effective that every effort had to be made to keep it from reaching the front lines.

The German propaganda was poorly organized and planned and in many cases fell into inefficient clumsy hands. It lacked appeal to make it effective.

Propaganda has two fundamentally different problems:

(a) For the defense.—It immunizes those on the front and in rear against the influences of hostile propaganda. It must make them feel they are part of the government and keep them informed of its workings so that in the end they actually desire that which happens.

This is difficult because the Germans are great newspaper readers and are critically minded and will not accept all they read in "their" paper. Due to the high intellectual average this would require high-calibered propaganda which is difficult to produce.

(b) For the attack.—This involves neutral people. Here the propaganda must justify actions at home and expose the enemy actions as unmoral and base. Every nation will require different methods in accomplishing this. Race and language must be utilized. It is not quite so difficult to carry propaganda to the enemy country. Propaganda is not a trade but an art. It is impossible to call in an interpreter and order him to "make propaganda." This will have the tradesman's results and be very poor. And it is dangerous, for every failure of propaganda is a boomerang. This should be the task of especially trained high-grade personnel who study the people who are to be subjected to the propaganda.

(18) EIN NEUZEITLICHER DSCHINGIS-KHAN. [The modern Genghis-Khan.] (II) (See abstract, page 72)

(19) DER FELDZUG GEGEN RUMÄNIEN 1916. [The campaign against Rumania in 1916.] von Collenberg

An interesting account of open warfare during the World War.

(20) DER LEHRZWECK DER PLANÜBUNG. [The educational value of map exercises.]

(21) EIN INTERESSANTES BEGLEIT- UND KAMPFWAGEN-ABWEHRGESCHÜTZ. [An interesting accompanying and antitank gun.]

The renowned Bofors Armory of Sweden has developed a remarkable double barreled gun for a dual purpose, to serve as an accompanying gun as well as an antitank gun, which they named the 81 /37-mm. minenwerfer and accompanying gun.

The weapon consists of an 81-mm. smooth bore barrel L 20 and a 37-mm. drawn barrel L 45. The breech, base and trail are the same for both barrels. The barrels can be quickly changed. The gun is equipped with split trails and has a range for the 81-mm. barrel of about 160 to 6,000 yards, for the 37-mm. barrel up to about 7,100 yards with initial velocity of 320 yards for the former and for the latter, about 800 yards per second. It is transported on wheels or can be moved in 6 loads by a crew of 12 men. Its weight is 990 pounds and its 81-mm. barrel uses a

winged projectile weighing about 10 pounds; the 37-mm. barrel uses a solid shot.

Critics of the gun object to the necessity of two kinds of ammunition and opposite firing positions. It has two distinctly different tactical missions and some critics believe there should be two separate weapons for this.

Those in favor of the gun state it requires but one crew to carry out two missions and simplifies organization. Actual combat will solve this question. A dual weapon can be used for dual purposes and usually an antitank gun will be necessary at such points as will be occupied by an accompanying gun and vice versa.

(22) NOCH EINMAL HEERES-SCHIMEISTERSCHAFTEN 1935. [The army master ski contest, 1935.] Lieut.Colonel Kreitmeyer

(23) TAKTISCHE AUFGABE NR. 8. [Tactical Map Problem No. 8.]

18 April 1935

(24) KAMPFWAGENABWEHR. [Antitank defense.] General v.Eimannsberger, Retired

The author states that the future defensive position must be able to meet all possible methods of attack. This position must be a combination defensive position against artillery as well as against tanks. This really means that the defense remains as heretofore with the additional antitank defense.

Tanks are generally employed in the same manner as during the World War. They either function as battering rams paving the way for the accompanying infantry or serve in the still debatable form in mass as a new assault unit. Also when used against semi-civilized and poorly armed people, they attack the flanks and rear. When used against a modern equipped civilized nation they must first assist in a breakthrough before they can reach the flanks or rear.

Apropos to this, the British and French estimate using one tank battalion for each assault division in the attack or 50 tanks to every mile. At the vital point of the attack, this ratio is increased to one tank regiment making about 50 tanks per one-half mile.

Opinion is still divided as to the use of the fast tanks although the principle is accepted that the leading tank wave attack with maximum speed regardless of the speed of the infantry. This speed will be approximately 10 miles per hour, due to the obstacles, trenches, mines, etc., which must be evaded or overcome. The artillery and air service must assist the tanks in their assault by counterbattery firing and engaging all definitely located antitank weapons.

The defense will require armor-piercing ammunition of 37-mm. or greater to disable tanks. The 47-mm. infantry gun is excellent for this purpose. Many advocate the super-heavy machine gun but the movement of the massive bolt is insufficient and the weapon is too heavy and cannot be operated by one man. In all probability the infantry cannon will be the antitank weapon. Lighter weapons may be used in advanced positions or against fast light tanks. The infantry gun will weigh between 550 and 990 pounds, depending on the use of the armored shield, etc.

It is estimated that the ratio should be one infantry gun, well camouflaged, for every 3 hostile tanks before the gun itself is put out of action. Since, normally, there will be 25 tanks per one-half mile, then one-third of these will be 8 cannon per one-half mile. Should the location be considered a vital point, then double the number will be required.

Here also is a conflict of opinion as to whether to distribute these guns over the front or to keep them in readiness to be moved forward in the direction of the threat. The latter seems most logical based on experience. The division has 60 antitank guns which are hauled behind trucks and must be unlimbered to be fired.

The author is of the opinion that it would be much better to give the antitank weapons to the infantry, say one cannon company of 6 guns per infantry battalion. This can be done by reorganizing the machine gun company. This would give 54 cannon per division. To this could be added an infantry cannon battalion with 3 companies which would

be under the direct control of the division to be used at decisive points, making a total of 72 infantry cannon per division. These would suffice for normal situations.

The reason for the foregoing suggestion is to provide alerted defensive weapons at all times. Should the enemy succeed in penetrating the front line he will be confronted by antitank weapons on all sides.

The author believes that between modern armies there will be no more attacks by individual tank battalions but only massed tank offensives. There will be surprise actions and the best defense will rest in possession of necessary reserves located within a half-day's march to the rear in a second defense zone. Additional army and corps reserves must be available to fill in gaps and finally a tank division must be available for a major counterattack.

(25) DAS GROSZE FRAGEZEICHEN BEIM KAVALLERIEPROBLEM. [The great cavalry problem.] Lieut. General Marx, Retired

Referring to statements which appeared in a previous article, relative to increasing the speed of cavalry ("Militär-Wochenblatt," 4 April 1935), the author comments as follows. Why have a mixed cavalry, one which moves by truck until the roads end or become unserviceable, then detruck and revert to horse cavalry? Why not motorize throughout? What terrain is there today that cannot be covered by mechanical conveyances? Had motorized conveyances been available in 1914, the Cavalry Corps of Marwitz could have enveloped the British flank much more quickly. The real questions seem to rise as to the use of mechanical conveyances during the fall rainy season and in forest covered terrain. Even the modern vehicles could not penetrate the Argonne today. It is said that the following are obstacles to cross-country conveyances: (a) Snow and ice, especially fresh snow; (b) Steep climbs, especially when covered by forests; (c) Sandy regions, dunes; (d) Soft earth, especially after fall rains or melting snow.

To these questions as to obstacles the author replies as follows: (a) The Wegner Greenland expedition traversed the difficult glacier and snow-covered terrain by tractor equipment in spring faster and with more certainty than could have been done with dog sleds. (b) Reference must be made to the new mountain sport, the climbing of high and steep mountain peaks with caterpillor or track-laying vehicles. By utilizing water courses, rock slides, etc., they can reach the peaks. Truly the woods does not enter into this and is a great obstacle but even horses can not traverse wooded country, especially pulling vehicles. (c) The author states that sand interferes with training areas but that he has participated in many maneuvers where trucks have succeeded. (d) The greatest problem is the soft earth, but invention is progressing rapidly and will overcome this difficulty. Only a few years ago American built "amphibian" tanks which could travel on wheels on the road, on caterpillar tracks when leaving same and could swim over small streams. It is hardly beyond the imagination to visualize some vehicle which will be able to fly over marches by use of helioclopter devices. The paddle wings are not so much to make the vehicle fly as to take the weight off the road to permit forward progress. The question of expense, etc., may prohibit such efforts.

(26) KRIEGFÜHRUNG UND EISENBAHNEN. [Railroads and combat leadership.] (I) Major Kretzschmann, Retired

The military value of a railroad lies in its great transportation capability and speed whereby a shifting of great masses of troops over great distances is possible. Mobilization, transportation of troops, supply of equipment, rations and ammunition have made the railroad an extremely important and necessary working tool for a commander in conducting a campaign.

An excellent rail net within inner lines of communication permits rapid shifting of reserves, thereby counterbalancing the numerical weakness of a force by giving it mobility. On the Western Front after the Battle of the Marne, when efforts were made to turn the extreme flank in the area between the Oise and the North Sea, the French were able to shift great masses of troops to the threatened zone, thanks to their undamaged rail

net. At Tannenberg in 1914, thanks to the railroad, the Germans were able to move the I Army Corps and 3 reserve divisions by rail close to the combat area, providing in due time the necessary strength with which to carry on the offensive.

The importance of the railroad increased when position warfare set in. But for their excellent rail net the Germans could never have saved themselves during the major allied drives in the Champagne region at Atrois, on the Somme or in Flanders. Careful coordination between rail and foot or truck marches is necessary for smooth operation.

(27) IST DER FRONTALE INFANTERIEANGRIFF NOCH DURCHFÜHRBAR? (EINE ERFAHRUNG AUS DEM CHACOKRIEG.) [Is the frontal attack still feasible? An experience from the Chaco War.] Brandt

During the War of 1870 mounted units suffered the greatest losses, especially the renowned Death Head Hussars of the German and French Cavalry. At this time infantry units were only armed with single shot weapons possessing short range. In 1898 the British machine guns decimated the mounted Mahdists at Omdurman. In spite of these lessons the training fields of Europe still witness spectacular cavalry charges which presented a beautiful picture to the eye. Experience and development of hand weapons and machine guns were not considered where cavalry was concerned. The frightful actuality of 1914 ended the 40-year dream under which cavalry had lived.

The same appears to be the case of the frontal attack infantry today. At St. Privat the Guard Regiment attacked without artillery and succeeded but with great losses. The attempted repetition of this at the beginning of the World War was a complete and bloody failure.

It was soon recognized that infantry required the strong support of artillery, heavy infantry weapons, etc. There was a steady increase in the massing of field pieces, mortars, etc.; similarly the number of machine guns increased until they reached about 30 per battalion.

The falling back of a French army to a prepared line brought the German offensive to an abrupt halt in the Champagne making the meticulous but massive artillery preparation of the Germans against the forward positions useless. The enemy had not suffered losses, had been alerted and occupied a position from which he could turn the Germans back. These new tactics have been so developed since the War that now it is impossible to know the location of the main line of resistance which in turn prevents carefully planned artillery preparatory fire.

The experiences of the Chaco War verify the correctness of the German defense fundamentals. They have proved that the "fox hole" offers better protection to individual soldier from artillery and mortar fire than the old-style trenches. For example, at the battle of Strongest at the end of May 1934, a Paraguayan battalion of 280 were forced into an area of about 200 by 200 yards and subjected to the fire of 400 rounds of 81-mm. guns. All shells fell in the zone occupied by the troops. When at last they surrendered it was found that they suffered only 80 killed and wounded, leaving 200 men and all machine guns fit for battle. Individual rifle pits (fox holes) had been used.

The Bolivian forces were equipped with 9 light machine guns and 13 machine pistols (presumably the submachine gun) per company. No wonder the infantry frontal attacks with and without artillery preparation failed. Only by surprise, or where the front was over-extended and organization in depth was lacking, could the infantry frontal attack succeed.

The author believes that frontal attack of today is just as futile as were the cavalry attacks of 1914. He believes that only enveloping movements can succeed. Naturally he states that for the time being infantry attacks can be supported by tanks but only until the nations have sufficient antitank weapons. The time is not far off when the frontal tank attack will meet the same fate of cavalry attacks. Tanks will be used in increasing masses to attack flanks and the rear of an enemy.

(28) DIE SPEZIALISTEN DES FRANZÖSISCHEN HEERES. [Specialists of the French Army.]

(29) FRÜHJAHRSMANÖVER DER ENGLISCHEN FLOTTE. [Spring maneuver of the British fleet.] Feuchter

The author gives a short account of the British combined fleet and air maneuvers held by the British from 7 to 15 March, west of Gibraltar on the Atlantic Ocean. One hundred sixteen airplanes and several aircraft carriers participated. An assumed enemy, Red, located somewhere in the Atlantic east of the Azores, was threatened by the Blue fleet whose coastline was assumed to extend from Lisbon to Morocco. The straits of Gibraltar were considered non-existant. It was the mission of the Blue fleet to cripple the Red maritime trade, whereas the Reds endeavored to eliminate this danger and keep the shipping lanes safe and open. Red had a slight superiority in battleships and large cruisers but possessed a great superiority in aviation (95 aircraft, consisting of reconnaissance planes, torpedo bombers and pursuit planes). The Blue fleet possessed a decided superiority in light warships (small cruisers and destroyers), but possessed only 12 bombing planes and 9 single-seater pursuit planes.

Although little detailed information has been published relative to the maneuver, some information as to the value of aviation is available. The Blues were able during the first two days to destroy 140,000 tons of the Red shipping. As soon as the Reds energetically employed their aircraft, they destroyed or crippled enough of the Blue fleet to equalize the loss of their shipping. Also they were able not only to safeguard their shipping now but were strong enough to assume the offensive.

The question of the use and value of aircraft carriers was not solved. Toward the end of the maneuver one aircraft carrier was sunk by the Blues but before this a detachment of the Red fleet belonging to the aircraft carrier "Furious" surprised and sunk a Blue cruiser and flotilla leader. An attack by aircraft of the aircraft carrier "Courageous" on the flagship of the Blues seriously damaged same. In a counterattack on the "Courageous," Blue aviators sank 3 destroyers but only slightly damaged the "Courageous," the damage not interfering with the aviation service.

Aviators of the "Furious" succeeded in sighting the Blue battleship "Queen Elizabeth" and after two bombing attacks damaged her sufficiently to cause her to lose considerable speed. The Red battle fleet was then able to sink her.

(30) TAKTISCHE AUFGABE NR. 8. [Tactical Map Problem No. 8.] A suggested solution.

(31) TAKTISCHE AUFGABE NR. 9. [Tactical Map Problem No. 9.] A map exercise.

25 April 1935

(32) DIE NACHT, IHRE BEDEUTUNG IN TAKTISCHER UND STRATEGISCHER BEZIEHUNG. [Tactical and strategic significance of darkness.] (I) Lieut. General Kabisch, Retired

I—Tactical.—The author describes the great difficulties of night fighting during the World War. Referring to the surprise night attack of General Emmich's Corps on Lüttich during the night of 5-6 August 1914, he states that the attacking troops were moved to the front early on the night of the attack. Due to the rain and intense darkness it was impossible for leaders to orient themselves. During the advance the artillery receiving false information would fire on its own columns until they were warned of their error. Identification was extremely difficult. Mixing of units and loss of direction soon interfered with leadership. Although original orders directed the use of the bayonet only, men soon started firing their pieces which was difficult to stop by commands or signals. Communications were disrupted and false reports and garbled reports were numerous. The attack continued in spite of the confusion through the wire obstacles during which each wave thought they were the advanced elements and often fired on those in front of them. By dawn the objective was reached, but by noon, due to lack of ammunition the troops had to be withdrawn again. Losses were heavy, including one division commander wounded and General von Wussow killed. When the reserve brigade arrived they found that the Belgians had retreated 5 hours before.

The author describes another night attack which occurred on the night of 7 September 1914, by the army of General von Hausen. The objective of this attack was given as the destruction of the hostile artillery which had held up the advance of the army and the overrunning of the hostile infantry. The orders for the attack arrived so late (3:20 AM) that it gave just sufficient time to awaken the attacking troops and start the march to the front. The order directed that no ammunition be issued for rifles or side arms and that the attack would be made with bayonet. The band was to precede the companies. This was indeed a very trying task, especially that of overcoming an enemy infantry that had been undefeated with bayonet as the sole weapon. It sounded like the order to the ancient gladiators, "Prepare yourselves to die." During peace time such an attack would call for meticulous preparation of every detail, departure lines would be marked off with white tape and objectives designated by subdued lanterns. Not so in this attack. None of the officers knew the location of the hostile positions. The predominating idea was to kill whatever appeared or crossed your path. The actual order to the commanders was so voluminous that it required too much time to read with the aid of a weak flashlight, so the order for the troops was: "Fall in —march direction of moon—carry on." The moon was just coming up. To make sure that no shots would be fired the bolts were removed from the rifles. The advance was steady in extreme quiet, broken only by an occasional shot. Then suddenly machine gun fire broke from the front with a buzz followed by the battle cry and the troops rushed forward. After the first burst the enemy withdrew to the rear. The German losses were comparatively few but the French were extremely heavy. This night attack would have been a complete success, as the French were being driven into the hands of the Hanoverian troops, except that orders were received for a withdrawal behind the Petit Morin. The Fourth Army was equally successful in its fighting so that an appreciable amount of terrain had been won. The French resistance stiffened so that soon the successes gained were gradually lost.

Despite the apparent success of the operation there had been great confusion and milling of the attacking forces. Orders were issued to be countermanded immediately with the result that everybody did not receive the changes in orders. An example of this occurred at Hill 342. After capturing this hill with a heavy loss of life, the commander was ordered to assist another unit. He left a garrison there and proceeded to carry out his mission. Other troops were then ordered to capture the hill with the result that more blood was shed by the Germans when friends attacked friends in the darkness. This night attack of General Hausen's forces caused the French units to be reduced to as low as 15 men per company, and compelled the French Corps to withdraw to the south.

(33) NOCH EIN WORT ÜBER "HEERESKAVALLERIE UND MOTORISIERTE VERBÄNDE." [More data on army cavalry and motorized units.] General v.Poseck, Retired

The author, referring to Colonel Guderian's reply in the 11 March 1935 issue of "Militär-Wochenblatt," to an article written by the author in the 11 and 18 February 1935 numbers, submits the following statements to clarify his stand on the combined use of army cavalry and motorized units.

The rate of speed table gives the following four categories, infantry, cavalry, armored cars and truck units a ratio of 1: 2: 7: 11. These figures, although they are purley theoretical, are quite accurate. To these should be added the aviation which will be the speediest and also having the greatest range of action. Each branch of service has its own peculiar capabilities, and it would be erroneous to throttle down the speed of a faster branch just to conform with that of a slower one.

The author calls attention to the capabilities of cavalry to carry on under circumstances where motorized vehicles would be useless. He refers to the German cavalry in 1914 when they covered great distances in the heat of August and September, going without water and oats. Forage was lacking for animals and rolling kitchens for the men. The riders

became listless baggage on the horse, adding to his fatigue. The horse survived on roof thatching and carried on throughout the campaign. Had there been a lack of fuel the trucks would have been unable to move. He also contends that motorized reconnaissance units cannot be used at night. Naturally darkness hinders any type of reconnaissance but in spite of this the horseman can go there and see and hear better than a machine with its light and noise. Local reconnaissance can best be conducted by horse or foot troops. The distant reconnaissance, which really consists of guarding and observing roads, should come under the category of security.

The author is inclined to refer to the infantry as the best cross-country weapon. Even though the development of the truck has made great strides in recent years, it still cannot overcome some natural obstacles such as streams, mountain trails, deep sand and soft ground or swamp land. The cavalry can still function in this type of terrain to a fair degree. He earnestly adheres to his convinction that the horse still is an important military factor and should not be discarded.

(34) AUFKLÄRUNGSKRÄFTE UND SCHNELLE TRUPPEN. [Reconnaissance forces and fast troops.]

When referring to fast troops the author means the horseman, bicyclist, motorcyclist, troops loaded on cross-country vehicles, armored cars and tanks. The various rates of speed prevent the uniting of horse and motorized infantry units first because they have different missions and next because one is road bound and the other is not.

Horsemen and cyclists have approximately the same speed, which is about twice that of a foot soldier. This is much too slow when foot troops are transported by trucks. The armored vehicles with their new equipment have about the same speed as trucks, but since their missions are so divergent it is not advisable to mix them in the division. It is true that during an advance, tanks are assigned to the open flank to truck units. Other than when used thus the truck or motorized units have sufficient protection from their preponderance of automatic weapons. The question whether a tank division can replace a cavalry division when working with infantry cannot be decided at present. Germany, due to her peculiar position between east and west, still needs her cavalry.

Fast troops in the infantry division.—Foot troops require reconnaissance forces which possess a speed greater than their own. The bulk of the division reconnaissance detachments can be secured from the cavalry and the cyclists. Mechanized forces can be allotted as follows: 1 platoon armored cars, 1 company of tanks. This number should not be exceeded if large mechanized forces are desired at other locations.

Today most divisions have numerous truck units at their disposal and when functioning near its railhead it can spare enough trucks to motorize one or two battalions without calling on the army for assistance. The division lacks a motorized reconnaissance unit to protect motorized units on the march. Such a unit should consist of riflemen, machine guns and antitank weapons, using either motorcycles or cross-country cars. In case of position warfare it can be used for messenger service or as mobile reserve.

The cavalry division.—For the same reason that cavalry is assigned to the foot troops for reconnaissance it will also be necessary to provide the cavalry with armored cars for distant reconnaissance. Assuming a fair proportion of reconnaissance equipment and combat forces as was done in the case of the infantry, then one motorized reconnaissance detachment for the division would suffice. Three companies of riflemen equipped with heavy weapons (for example, individual guns on motorcycles) for antitank defense will be sufficient.

The mechanized division.—The problem of a motorized division has not been definitely settled in any army. The question whether it will utilize motorcycles, half-tracks, multiple-wheel cars or full track vehicles, to carry the riflemen, has not been settled. The motorcycle and the multiple-wheel vehicles are superior to the half-tracks and full tracks in cross-country maneuverability. It really makes no difference if one-third or two-thirds of the riflemen are carried on motorcycles or multiple-wheel vehicles

In all probability the heavy weapons will be on the multiple-wheel vehicle. If a motorized division is organized it should consist of nine battalions motorized riflemen; the same amount of artillery will be apportioned as in the infantry divisions. The armored troops will consist of a detachment of several troops of street fighting armored cars. The distant reconnaissance for a motorized division cannot be carried out by ground troops without slowing them down, therefore the air service is used for this purpose. The development of radio has made communication between the air force and ground troops very rapid.

The tank division.—The tank division must be able to advance of its own initiative and requires approximately the same reconnaissance as is required for the cavalry division. Several troops of street fighting armored cars would suffice for this purpose. The remainder of the division would consist of several brigades of 3 to 4 tank battalions each. The equipment of the tank division would consist of light and medium tanks and motorized artillery on self-propelled carriages.

Heavy tanks do not belong in the tank division as they would retard the rapid march mobility necessary in mobile warfare. These must be available to special brigades to assist in converting a stabilized situation into a mobile one.

The heavy troops.—The heavy troops can follow behind the reconnaissance screen of the motorized division.

Most armies assume the proportion 1:9 between the number of rifle battalions and the reconnaissance units. According to this, one mobile (cross-country) division would be able to furnish security for 9 other divisions. The movement of large armies is still possible today and the employment of 10,000 trucks for such a movement is considered normal by European countries. Naturally, the foot troops when leaving their home stations possess their essential ration and supply trucks and after unloading same are kept available for tactical and supply service.

The final result of a raid made by a motorized division may be the decisive blow given by an army suddenly brought forward to the scene.

Utilization of the various types of fast troops.—None of the new type troops are designated to replace the old standard organizations. Infantry, cavalry, mechanized, motorized and tank divisions must cooperate in their functions.

(35) KRIEGFÜHRUNG UND EISENBAHNEN. [Railroads and combat leadership.] (II) Major Kretzschmann, Retired

In addition to its ability to facilitate the tactical shifting of troops from one area to another, the railroads, as shown by experience in the World War, provided the essential army supplies. The long duration of modern battles and the disruption of combat equipment increased the needs for military supplies of all kinds. It became necessary not only to study the capabilities of the rail supply before launching an operation, but also whether the necessary supplies were available. On the eastern front railroads forwarded supplies approximately 75 miles from the front lines using trucks and animal-drawn transportation from railheads to troops. Operations which progressed rapidly into hostile territory were stopped more often due to a breakdown of the supply service than from enemy resistance. Because of this, operations had to follow a rail net which could be repaired and maintained more quickly than a narrow gauge service could be installed. The advent of position warfare created an even greater need of rail supply for construction material, in addition to the normal combat material. Toward the end of the War the railroads were barely able to meet the most urgent military needs due to deteriorated condition of their rolling stock from long continued and hard pressed service without repair.

The use of railroads in future wars depends on the development of the automotive service and air service. Even during the World War trucks relieved the load on railroads by movement of supplies forward in the advanced areas. The rapid and great development of trucks will make it possible not only to use them for supply service but also for troop movements. In spite of this it would be absurd to believe that the railroad had outlived its usefulness as a military adjunct.

The development of air service has been such that rail transport service will be in constant danger of disruption due to bombing, etc., of the lines. No longer will movements go unmolested as in 1914. This danger of disruption goes far into the rear areas due to the long range of effective air flights.

The railroad will be used mostly for movements over great distances to carry troops and supplies. The motor transport will take care of moderate and short hauls. Greater coordination between the two services will be necessary in the event of disruption of either one.

(36) KRIEGSERFAHRUNGEN UND GEDANKEN DARÜBER. [War experiences and their evaluation.] General Reinicke, Retired

(37) BETRACHTUNGEN ÜBER DIE RÜCKWÄRTIGEN VERBINDUNGEN IM CHACOKRIEG. [Observations of the line of communications in the Chaco War.]

The Bolivian Army was far superior to the Paraguayan Army in training, armament, leadership, number of troops and industrial technique, but its geographic location to carry on a war was just as poor as the former items were good.

The distance separating the principal city of La Paz with the end of the railroad at Villazon is about 496 miles. From this point a fair road 62 miles long leads to Tarija; from there to San Antonio, a small town which is the headquarters and S.O.S. center of the army, are 90 miles of poor road. To reach Villa Montes it is necessary to cross the Pilcomayo River over which there is one bridge. Everything from trucks, personnel, horses, equipment, munitions, etc., must be floated across on rafts. This delaying factor must be considered in all military operations. The Army Headquarters is separated from the front lines by 430 miles over the worst roads conceivable. This makes it necessary to transport all supplies and troops from the high plateau to the front, over 1240 miles; most of this distance by trucks over miserable roads. Under favorable conditions this requires 14 days. The cost runs into large figures.

In addition to the foregoing difficulty it must be remembered that the Bolivian soldier comes from the highlands 12,000 feet above the sea level and when transported to the extreme lowland endured great hardships due to change of climate.

The Paraguayan soldier was at home in the swamp land and accustomed to the climate. From the foregoing it is easy to conceive why the Bolivians, in spite of their superiority in some respects, had to withdraw.

(38) DER WIRTSCHAFTLICHE UND MILITÄRISCHE AUFBAU DES FERNOSTGEBIETES IN DER UdSSR. [The industrial and military development of the Far East zone of the Soviet Union.]

(39) DIE NATIONALGARDE DER VEREINIGTEN STAATEN VON AMERIKA. [The National Guard of the United States of America.]

(40) TAKTISCHE AUFGABE NR. 9. [Tactical Map Problem No. 9.] A suggested solution.

4 May 1935

(41) AUS GROSZER ZEIT VOR ZWANZIG JAHREN. DIE DURCHBRUCHSSCHLACHT VON GORLICE. [Twenty years ago. The breakthrough offensive at Gorlice.] (I) Lieut.General Ziethen, Retired

During the spring of 1915 after the loss of Przemysl, the high command of the German and Austrian forces feared another strong Russian attempt to break through the Carpathian front and invade Hungary. This fear caused the Austro-German commanders to agree on an offensive south of the Vistula between Gorlice and Tarnow to force the Russians from the Carpathian front as far as the Lupkow Pass and thereby also relieve pressure on the Eastern Front. The final objective of this offensive was to paralyze the Russian offensive power for a long time. General Mackensen was assigned the command for this offensive.

Concentration of the forces was rapidly carried out so that from 17 to 22 April the troops were ready in the vicinity of Krakow. Surprise was desired. To assure surprise the German officers making the reconnaissance wore Austrian caps. The Russians were organized in several lines in depth, the trenches were visible from a distance and the obstacles

were not as strong as those on the Western Front. Air reconnaissance revealed a second defense system about 4 miles east of the first line.

The attack started on 2 May after intensive artillery preparation. The author lists the units participating in the offensive and describes the attack which progressed rapidly resulting in a complete victory and a breakthrough along the entire front of the German Eleventh Army. Pursuit was started to prevent a closing of the broken front.

(42) DIE NACHT, IHRE BEDEUTUNG IN TAKTISCHER UND STRATEGISCHER BEZIEHUNG. [Tactical and strategic significance of darkness.] (II) Lieut. General Kabisch, Retired

The author believes that all night attacks are arranged in a hurry, lacking reconnaissance and preparation; even surprise, which is essential, was lacking in many cases. He describes the night attack at Lüttich on 5 June and the night attack by the Bavarian 6th Reserve Division at Wytschaete on the night of 31 October-1 November 1914. This attack failed due to a failure of artillery cooperation. The attack on the village of Samogneux on the Verdun front can be termed a model night attack. With the use of flame projectors the Germans were able to capture the entire garrison with very small casualties.

In most night attacks the riflemen would fire too high, whereas the machine gun which was set on its final protective line never made this mistake. The greater the force making the attack the less chance it has to succeed. Unless a night attack and subsequent attacks penetrate deep into the hostile territory they usually fail in their success.

Night and darkness create conditions which have just the opposite effect on strategy from that noted on tactics. Troop movements can be hidden from hostile air service. Even though large movements occur toward a given front and the enemy is aware of this he still is ignorant as to where the blow will fall. This blow can be started at night. Night movements can be detected by aviation through the medium of flares.

In conclusion, the author emphasizes that night combat always makes it difficult to differentiate between friend and foe and often results in blind murder. Training in night maneuvers is the best method of keeping losses down and preventing cases of "nerves" from influencing the troops. Real leadership is necessary.

(43) DER MISZVERSTANDENE SCHLIEFFEN. [The misunderstood Schlieffen.] Guderian

The author comments on the criticism to which Count von Schlieffen was subjected after the publication of his book, "The War of the Future," published in 1909. He was referred to as the modern Alexander and his work as the technique of 1909. His ideas of leading large modern armies were radical to the existing trend. His ideas were the death knell to the mounted adjutants who were messengers to distribute orders and the mounted couriers who acted as intelligence officers. The invention of the telegraph and telephone, motorization and aviation, suggested more rapid means of communication and control of large armies. His vision of the use of heavy army artillery, etc., differed from current use.

His book drew the same type of criticism that Lieut. Nehring's "Armies of Tomorrow," or General Fuller's "Generalship," have been subjected to for advocating and prophecying the use of mechanized forces and aviation. The author explains that these new weapons are not only auxiliary weapons but have been powerful branches of the service which can carry the balance of power in deciding a battle. Like Schlieffen, these authors visualize future use of modern inventions as weapons which may revolutionize tactics to carry out strategic principles.

(44) LEISTUNGSSTEIGERUNG NEUZEITLICHER KAVALLERIE. [Increased capabilities of modern cavalry.]

The author expresses the opinion that even though motorization and mechanization have made great strides, that the horse cavalry is still indispensable. Its range of movement by truck will progress with the mechanical advancement of that vehicle. The author feels that the horse himself can be improved by:

(a) Improved selection and competitive type of endurance tests on a large scale;
(b) As long as the horse possesses greater cross-country ability than the motor they should not be mixed.
(c) Improved harness and vehicles;
(d) By improvement of the combat strength, technique of orders and technical branches.

(45) DIE NEUE SCHIESZVORSCHRIFT FÜR DIE ARTILLERIE. [The new firing regulations for the artillery.] General Marx, Retired

(46) TAKTISCHE AUFGABE NR. 10. [Tactical Map Problem No. 10.]

11 May 1935

(47) AUS GROSZER ZEIT VOR ZWANZIG JAHREN. DIE DURCHBRUCHSSCHLACHT VON GORLICE. [Twenty years ago. The breakthrough offensive of Gorlice.] (II) Lieut.General Ziethen, Retired

On 3 May General Mackensen, anticipating resistance in the Russian rear areas, ordered his attack along the entire front. To reach the Russian Carpathian rear by the shortest route he made his main effort on the south by reinforcing that flank and assigning General Emmich to command same. The maneuver was successful, the German and Austro-Hungarian forces reaching the Wisloka River and making the Lupkow Pass untenable for the Russians. The breakthrough went beyond the Russian third line of defense and the German advance continued until it ran into the defensive position of Przemysl. This offensive represented one of the greatest demonstrations of cooperation between infantry and artillery, not only in the initial attack but also in the pursuit.

(48) DER RUSSISCHE NACHRICHTENDIENST VOR DEM GORLICE-DURCHBRUCH. [The Russian intelligence service prior to the Gorlice breakthrough.] General Noskoff

The Russian intelligence service before and during the War was considered extremely efficient and it was a known fact that she paid great sums to maintain her numerous agents in Germany during the War. For this reason it seemed almost unbelievable that she was unaware of the concentration of General Mackensen's Eleventh Army in the vicinity of Gorlice.

The author was the former head of the intelligence service of the southwestern front with General Iwanov, who commanded the Russian Third Army, which was Mackensen's objective. Although he left that detail one month before the attack, the author states that the Third Army had no Russian agents behind the hostile front but depended on St. Petersburg for all its intelligence information from agent sources. General Iwanov was not satisfied with this method of securing his information.

Efforts were made by the Third Army to organize intelligence agents for this purpose and large sums of money were allocated but agents were scarce and hard to find.

Efforts to determine whether the Germans intended to invade the Carpathian area to assist the Austrians resulted in information which arrived too late to be of value since General Linsingen had already arrived in the Carpathians. The German intelligence bureau in Bucharest permitted erroneous and misleading information to be spread with the result that information received by the Russians was worthless.

Both the local and army intelligence service failed prior to the Gorlice drive. Information was received of alleged German advances from so many divergent areas that a true picture became impossible. The Russians were aware of the threat against their Third Army but the fault of their actions to meet this threat lay with the command higher than that of the Third Army.

(49) FRANZÖSISCHE UND ENGLISCHE GEDANKEN ÜBER DEN LUFTKRIEG. [French and British theories of aerial warfare.] (I) Colonel Nagel

The air defensive.—Much has been done in antiaircraft defense on land and sea, but according to the author little has been done for the defense of the air itself. Truly bombers and other aircraft can be destroyed in their hangars, but combined defensive measures, using aircraft, anti-

aircraft weapons and balloon barriers, are necessary to protect areas behind friendly lines.

It is impossible to maintain an air outpost but this can be remedied by successive alarm stations on the ground which can warn air units which are alerted to take the air on 20-minute notice. A second group farther in the rear should be ready to take the air on 45-minute notice. Hostile aircraft coming 180 miles per hour will penetrate 60 miles of friendly territory before meeting air resistance which progressively becomes greater.

Colonel Chamier, British Army, advocates cutting off the hostile air invaders by using heavy combat ships armed with machine guns and bombs and permitting the light fast pursuit ships to destroy those hostile units which become separated from the main force.

General Armengaud suggests a daylight defense of pursuit ships and night defense of 2-seater night pursuit ships working in cooperation with the searchlights.

The ground defenses form the strong points about which the air defense operates. According to General Armengaud, in fair weather pursuit aviation should be able to account for one-fourth to one-half of the hostile bombers, and on clear days the antiaircraft should be able to account for one-seventh to one-fourth of the hostile bombers. At night or on overcast days this percentage is cut about one-third. Any collision with the dangling cables of the balloon barriers will cause a crash or forced landing. At present these rise 3,500 yards and soon will be able to go 5,000 yards.

Principal cities and vital centers are protected by an additional barrier of searchlights and night flying pursuit ships. This requires one searchlight group and 1 or 2 planes per 8 miles of frontage. To provide protection during inclement and cloudy weather this is augmented by antiaircraft batteries so that every 4 or 5 guns can simultaneously engage a hostile plane or squadron on their approach and return flights.

The air offensive.—The mission of the offensive air force is to bring the war to an early termination by attacking and destroying vital and sensitive enemy points.

Morale and financial losses can best be inflicted on large cities which are rail terminals and the hub of communications and roads. Destruction of railroad stations, harbor facilities, government and factory structures, will cause disruption and loss of commerce and industry. Modern warfare is a war of materials and the country best supplied has the advantage. Mobilization takes considerable time after the declaration of war, therefore aviation can strike at the above centers quickly and delay, cripple or destroy supply of offensive war materials creating great confusion thereby. This must be done before their air defense becomes organized.

(50) ABWEHR GEPANZERTER KAMPFFAHRZEUGE DURCH PIONIERE. [Defense against armored combat vehicles by the engineers.]

The author feels that the theoretical assignment of one antitank company per regiment and one antitank detachment per division is not sufficient and the defense should be augmented by works prepared by the engineers. He believes that in broken terrain small groups of trees and brush barricades can be used as obstacles, and bridges destroyed and mines placed to bar or retard tank progress. On the open terrain mine fields flanked by antitank weapons can be prepared. These could be placed in the wire obstacle area which tanks usually try to break down to pave the way for infantry.

(51) TECHNISCHER RUNDBLICK. [A technical review.] Colonel Blümner, Retired

An article on importation of necessary raw materials and essentials for military security of a nation.

(52) DIE ORGANISATION DER KRIEGSWIRTSCHAFT IM AUSLANDE. [The organization of foreign war industries.] Captain Ruprecht, Retired

(53) DER GASKRIEG NACH FRANZÖSISCHER AUFFASSUNG. [The French conception of gas warfare.] Major General Schulz, Retired

The author quotes Pierre Cot, former French Minister of Aviation, as stating that France has a great dread of aerial warfare with its possi-

bility of bombing Paris with gas. She well remembers 1915 when on a 6-mile front, 5,000 Russians perished and 25,000 were disabled by gas within an hour. The strength of one Siberian regiment was reduced from 4,000 to 400 within 20 minutes. The World War demonstrated that gas could be carried farther by air than it could be projected by artillery. Air bombs can carry more gas than a shell could hold, also the bombing radius of aviation has increased 100% since the World War. This makes industrial centers far in rear vulnerable. Darkness, fog and clouds during the World War represented the greatest obstacle to hostile bombers, whereas today they are its greatest aids, due to the air navigation instruments.

Most maneuvers in various countries have demonstrated the inability to prevent hostile aviation from reaching its objective. Antiaircraft defense even in clear weather has been inadequate, and it is useless when the skies were overcast. It is admitted in Europe that almost every capital could be saturated with gas in one day with France as a base of operations. Efforts are made by all nations to discover new gas so that in the event of war, gas masks may be ineffective. Pierre Cot differs with America's statement that gas is a humane weapon for the reason that all Americans were provided with masks and had not been exposed to all kinds of bombing.

Pierre Cot gives no solution to prevent air bombing on the fear of such bombing.

(54) POLITISCHE ARBEIT IN DER ROTEN ARMEE. [Political activities in the Soviet Army.] Maurach

(55) TAKTISCHE AUFGABE NR. 10. [Tactical Map Problem No. 10.] A suggested solution.

MILITARY ENGINEER

September-October 1935

(1) CHEMICAL AGENTS IN AID OF DEMOLITIONS. Captain Waitt
(2) STRATEGIC MINERAL SUPPLIES. 5. TUNGSTEN. Major Roush
(3) CROSSING BARBED WIRE ENTANGLEMENTS. Lieutenant Gray
(4) ETHIOPIA AND EUROPEAN WAR. (Editorial)
(5) MAPPING BY THE USE OF AERIAL PHOTOGRAPHS. Lieutenant Talley
(6) INDUSTRIAL DEVELOPMENT IN THE SOVIET REPUBLICS. Captain Dolkart
(7) SURVEY AND MAP CONTROL FOR LOS ANGELES. Sanders
(8) ROCK REMOVAL BY SURFACE BLASTING. Lieutenant Read
(9) PLANIMETRIC MAPS OF THE TENNESSEE VALLEY. Pendleton
(10) THE ST. JOHNS RIVER JETTIES. Murr
(11) CONSTRUCTION OF RATING CURVES FOR RIVERS. Grummann
(12) AIR COOLED ENGINES FOR MILITARY SERVICE. Doman
(13) LOWERING TELEPHONE CONDUIT WITH ICE. Young
(14) CAST-IN-PLACE CONCRETE PILES. Bouillon
(15) HYDRAULIC DREDGING. Roane

November-December 1935

(16) ETHIOPIA AND ITALY. Brigadier General Harts
(17) MOVING AN ENGINEER BATTALION BY MOTOR. Major Danford
(18) PRINCIPLE OR INTEREST? (Editorial)
(19) MILITARY SURVEY OF PANAMA. Captain Wilson
(20) THE USE OF SMOKE TO COVER A LANDING. Major Barker
(21) RADIO DEVELOPMENT AND ENGINEERING. Lieut. Colonel Colton
(22) THE EUROPEAN SITUATION. Major Reynolds

MILITARY SURGEON

September 1935

(1) THE EARLY DEVELOPMENT OF AVIATION MEDICINE IN THE UNITED STATES. Brigadier General Wilmer

(2) THE PRESENT NEED FOR AIRPLANE AMBULANCES BY THE UNITED STATES ARMY. Lieut. Colonel Beaven

October 1935

(3) WOUND BALLISTICS. Lieut.Colonel Callender
(4) ARMY MEDICAL PERSONNEL EARLY IN THE 19TH CENTURY. Lieut. Colonel Lull

November 1935

(5) GUNSHOT WOUNDS OF THE LIVER. Colonel Davis

NAVAL INSTITUTE PROCEEDINGS

August 1935

(1) THE HUMAN FACTOR IN WAR. Lieutenant Krause
(2) PERMANENCE IN COMMAND AFLOAT. Captain Wygant
(3) AMERICAN TRADERS ABROAD. Captain Colby
(4) THE H-TYPE POCKET BATTLE CRUISER. Hoffman
(5) COMMERCIAL COMMUNICATION SYSTEMS AND NATIONAL DEFENSE. Lieut.Commander Johnson
(6) FLEET REPAIR FACILITIES ASHORE. Lieut.Commander Walker
(7) AIR NAVIGATION WRINKLE. Lieutenant Thurlow
(8) STRAIN'S PANAMAN EXPEDITION. Kirkpatrick
(9) THE FENIAN RAM. Lieutenant Rucker
(10) UPPER-AIR SOUNDINGS BY AËROGRAPH. Lieutenant Nelson

September 1935

(11) INTERNATIONAL LAW AND THE SUBMARINE. Lieutenant Rickover
(12) LOOKING BACK AT THE TURBULENT VIRGINS. Captain Baker
(13) THE JAPANESE SITUATION. Captain Knox
(14) THE STRATEGIC SITUATION IN THE BALTIC. Hovgaard
(15) NOTES ON INTERNATIONAL AFFAIRS

October 1935

(16) DESCRIPTION OF THE UNITED STATES NAVAL ACADEMY. Lewis
(17) ENTRANCE REQUIREMENTS OF U.S. NAVAL ACADEMY. Commander Rooks

NAZIONE MILITARE (Italy)

By Major F. During, Infantry

April 1935

(1) L'EDUCAZIONE FISICA IN REGIME FASCISTA. [Physical training under the Fascist regime.] Vaccaro
(2) GLI ORGANISMI ATTIVI DELLA FORTIFICAZIONE CAMPALE. [Field fortifications.] Ferreri
(3) LE ORGANIZZAZIONI DEI COMBATTENTI FRANCESI. [Organization of the French veterans.] Gorresio

May 1935

(4) LA RELAZIONI DIPLOMATICHE ITALO-ABISSINE DAL 1897 AD OGGI. [Diplomatic relations between Italy and Abyssinia.] Pigli
(5) LA ORGANIZZAZIONE DELLE NAZIONI PER LA GUERRA. X. LA GERMANIA. [Organization of nations for war: Germany.] Franchini
(6) GINNASTICA MILITARE E PREPARAZIONE BELLICA. [Physical training and preparation for war.] Piazzoni
(7) NOTE CAVALIERE—PASSATO E PRESENTE DELLA CAVALLERIA RUSSA. [The Russian cavalry—past and present.] Zavattari

According to the author, the Russian cavalry consists of 16 cavalry divisions and 9 independent cavalry brigades. Each division has 3 brigades, one divisional machine gun squadron, one regiment of artillery (horse) of 2 battalions, one engineer squadron, one antiaircraft platoon (machine gun), one chemical platoon, one communications platoon and the necessary supply establishments, trains, etc. The cavalry division has no motorized units. The Russian training regulations state "that a mounted attack is the decisive means of obtaining a victory," and "the cavalry unit is so trained that it will only attack mounted."

(8) UN NUCLEO ESPLORANTE IN AZIONE. [A reconnaissance detachment in action.] Costa

June 1935

(9) GIUGNO MCMXVIII—COME DIAZ PREPARO IL PIAVE. [June 1918. The preparation for the battle of the Piave by Diaz.] Baldini

(10) UN BATTAGLIONE DI FANTERIA NELL'ATTACCO IN ZONA MONTANA E BOSCOSA. [An infantry battalion in the attack in mountainous and wooded terrain.] Sapienza

For this exercise a battalion was reenforced by one battalion of artillery and two platoons of heavy machine guns. The attack was prepared by a massing of troops at the decisive point of attack, artillery preparation of short duration and attachment of the two heavy machine gun platoons to the front line company.

PIONIERE (Germany)

By Captain H.D. Vogel, Corps of Engineers

May 1935

(1) BEFEHLSGEBUNG FÜR DIE "ALBERICH"-SPERRUNGEN. [Orders for the Alberich defenses.]

Alberich was a general name applied to the positions prepared during the winter of 1916-1917 in anticipation of a retrograde movement from the so-called Siegfried position, which ran from east of Arras past Bucquay, thence to the vicinity of Bouchavesnes, thence to Chaulnes, and thence in a southeasterly direction to parallel the Aisne River along its northern slopes. The new line of defense tied into the old in the vicinities of Arras on the north and Crouy on the south, but was drawn back in the center to the vicinity of St. Quentin. The sector was held from north to south by the German Sixth, First, Second and Seventh Armies. The article describes in considerable detail the preparations that were made for the withdrawal of the forces in contact and the orders that were issued to accomplish the movement.

(2) ZUSAMMENWIRKEN ODER UNTERSTELLUNG. [Cooperation or subordination.]

The continuation of an earlier article, in which the functions of engineer troops are discussed. The question is revived, "Can engineers render better service by working in cooperation with their higher infantry units, or should they be attached thereto?"

(3) EINE STABS- UND MELDEÜBUNG. [A staff and report exercise.]

The author describes a combined map and field exercise designed to train officers and troops in the dissemination of information and transmission of messages. Particular employment is made of the engineers.

(4) DIE EINZELAUSBILDUNG DES PIONIERS. [Specialized training of Engineers.]

This article bears particularly upon problems of recruit training, and indicates the difficult task confronting the officer who must develop technicians and specialists from run-of-the-mill material.

(5) PIONIER-NACHRICHTENMITTEL. [Engineer means of communication.]

Conclusions developed by the author in this discussion of a problem are as follows: No one example of signal communications can be cited as ideal; each must be considered according to the tactical situation and the terrain. The installation of communications can be expedited by the employment of equipment belonging to the infantry battalions. Important connections to companies should be safeguarded by the use of radio nets. Secrecy must be preserved by codes, remembering that the enemy is always listening. Double lines of signal communication should be installed up to about 1½ miles behind the front.

(6) AUSBILDEN DER PIONIERKOMPANIE. [Training of the engineer company.]

Elementary notes on leadership and troop training by an officer who knows whereof he speaks. To quote briefly, "The training (of soldiers)

must be in the hands of a qualified leader—a real officer. Above all else he must show a personal interest in this type of duty, and be able to hold his men together as a unit."

(7) STURMPIONIERE IN DER ANGRIFFSSCHLACHT 1918. [Storm pioniers in the 1918 assault.]

A dramatic recital of the exploits of engineer platoons of the German 7th Division in the attack that was launched against British forces northwest of Hollebeke in April 1918. It is pointed out by the author that the success of the engineers in this action was due not to any inherent strength but to their ability and opportunity to strike at a decisive point at the decisive moment. Considerable credit is given the engineer commander for his cooperation with the infantry and his initiative in picking the proper objectives and means for their destruction.

(8) SPRENGUNGEN IM ZIVILEN LUFTSCHUTZ UND BEI GROSZFEUERN. [Demolitions in connection with protection against air attacks on civil institutions and against large conflagrations.]

The havoc wrought by large bombs dropped from the skies is too well known to merit long description. Suffice it to say that a 100-pound bomb will knock all windows and doors from a house if exploded 50 yards in front of it, and that a 200 to 1,000-pound bomb will drive in an entire wall. A 2,000-pound bomb will, of course, accomplish complete destruction of almost any moderate sized building. In wartime it may be expected that many conflagration bombs will be dropped and resulting fires may then be so great as to defy ordinary fire-fighting equipment. Demolitions must then be employed to limit the destruction. This raises the question, "Over how wide an area will the effects of demolitions be felt and, corollary to this, how can the effects of demolitions be limited?" The author presents his discussion with diagrams to indicate the proper locations of explosives in typical cases, and closes with the suggestion that—if possible—architects familiar with the construction of the particular building or block of buildings be called to advise the commander of demolition troops as to locations of key supports and stanchions.

(9) NORMUNG IM BEHELFSBRÜCKENBAU. [Rules for bridging expedients.]

By way of introduction, the editor states, "In this article a most interesting and controversial subject has been cut into. It is the more welcome since bridging expedients have long been the stepchildren of engineer training." However this may be, it is not likely that the ensuing discussion will serve in any way to end all discussions of the matter. Several sketches of trestle construction are presented, but all appear somewhat more elaborately and precisely designed than would be normally warranted. Timber construction is, of course, the rule, and it is expressly pointed out that steel and wood are generally impracticable in close proximity since they possess different moduli of elasticity. A new organizational set-up is recommended for the construction of an 8-ton bridge.

(10) UNTIEFENSUCHER UND FLUSZPROFILMESZAPPARAT. [Sounding device and river profile measuring apparatus.]

A brief, illustrated description of a clever device which, when installed on the bow of a small skiff, may be employed for the procurement of stream cross-sections. While the apparatus is ingenious in conception and of probable value in connection with hydrographic surveys of canals and small, natural water courses, it is doubted if its usefulness might be extended to the measurement of large American rivers. Its complicity of design and obvious vulnerability would probably preclude its employment in a deep and turbulent stream.

(11) BETONIEREN UNTER WASSER. [Placement of concrete under water.]

This article constitutes an excellent elementary discussion of the tremie and its conventional use. A similar discussion is contained in Trautwine's "Civil Engineer's Pocket-Book," 1911 edition.

(12) FESTUNG GLATZ IM 18. JAHRHUNDERT. [Glatz fortress in the eighteenth century.]

The fortress of Glatz and its several capitulations are described in a brief manner by the use of statistics and photographs. This and the

next following article are presented as discussions to the paper, "Schweidnitz in the Seven Years' War," which appeared in the February issue.

(13) MINENKRIEG VOR SCHWEIDNITZ 1762. [Mine warfare at Schweidnitz.]

The work of placing mines before the fortifications of Schweidnitz was accomplished in 14 days by 40 miners and 200 vulunteers. These were exploded during the night 8-9 October 1762, and eight hours later the fortress surrendered. The Miner's Corps of Frederick the Great had justified his confidence in them.

(14) GASPIONIERE IM WELTKRIEGE. [Chemical troops in the World War.]

This article describes briefly the employment of the 37th Pionier Battalion as chemical troops in an assault on the "Joffre position."

(15) PIONIERE BEIM DEICHBRUCH IN DER ELBINGER NIEDERUNG. [Engineers at a levee crevasse in the Elbe valley.]

A description of expedients employed to close a small levee crevasse.

QUARTERMASTER REVIEW

September-October 1935

(1) THE FEDERAL AIRWAYS SYSTEM. Vidal

(2) THE CAPTURE OF WASHINGTON. Redmond

(3) EARLY MILITARY RECORDS AND MEMORANDA. Captain Hagen

REVISTA DEL EJERCITO Y DE LA MARINA (Mexico)

By Major J.J. Waters, Jr., Field Artillery

April 1935

(1) LA INFANTERIA EN LOS ULTIMOS CIEN METROS. [The last 200 yards of the infantry assault.]

A discussion relating to the necessity of an infantry weapon with great fire power to replace the artillery fire when it lifts in the last 200 yards of the infantry assault.

(2) EL NUEVO REGLAMENTO DE MANIOBRAS DE LA ARTILLERIA ALEMANA. [The new drill regulations of the German artillery.] Major Jáuregui

(3) LAS INSTITUCIONES MILITARES DE SUIZA. [The Swiss military organizations.] Colonel Hernandez

(4) AMETRALLADORA LIGERA SISTEMA MADSEN. [The light machine gun, Madsen type (Model B, caliber 7-mm.).] Lieutenant Macias

(5) EL MAL DE LOS AVIADORES. [The dangers of an aviator.] Dr. Beyne

A discussion of the effects due to the speed, altitude, rarified air, etc., and its effect upon the pilots or passengers.

(6) LA AMETRALLADORA LIGERA. [The light machine gun.] Colonel Cortés

A discussion of the caliber, weights, ammunition and the suitability of the Madsen type.

(7) GEOGRAFIA ESTRATÉGICA DE LOS LITORALES MEXICANOS. [Strategical geography of the coast lines of Mexico.] Captain de Nava

(8) EXPLOSIVOS. [Explosives.] Lieut.Colonel Croselles

(9) QUÉ PROPORCIÓN DE ARTILLERIE DEBE TENER NUESTRO EJÉRICTO. [What proportion of artillery should our army contain?] Lieut.Colonel Cárdenas

In this article is given the increase of artillery in the French Army during the period 1914-1918 and the number used in various battles by the French during the World War. It also describes the failure of the infantry to hold and to take ground by its lack of fire support. The present division organization has one regiment of three groups with three batteries in each group. This will no doubt be increased by the Six-Year Plan ending in 1940.

(10) URBANIDAD Y CORTESIA MILITARES. [Military customs and courtesies.] (I) Major Cravioto

(11) SERVICIO DE SEGURIDAD EN UN AERÓDROMO EN CAMPANA CONTRA ATAQUES AÉREOS Y TERRESTRES. [Security of an airdrome in battle from air and terrestrial attack.] Major de Serow

(12) HISTORIA DE LOS INCAS. [History of the Incas.] Major de la Barrera

May 1935

(13) LA BAJA CALIFORNIA EN 1861. [Lower California in 1861.] Torrea

(14) NOTAS SOBRE LA MANERA DE MARCAR LAS GRADUACIONES DE LAS ESPOLETAS DE TIEMPOS. [Notes on the method of marking the graduations on time fuses.] Captain Cruz

(15) CONSEJOS A LOS JEFES DE SECCIÓN DE ARTILLERIA. [Advice to chiefs of sections of artillery.] Major Lindsay-Henderson

(16) PATRULLAS Y RECONOCIMIENTOS. [Patrols and reconnaissance.] Colonel Salcedo

(17) EL PAPEL DESEMPENADO POR RUSIA EN LA GUERRA MUNDIAL. [The Russian casualties in the World War.] General Goulevitch

(18) APUNTES SOBRE LA INSTRUCCIÓN DE COMBATE DE LA INFANTERIA. [Points on combat instruction of infantry.] Colonel Hernandez

(19) ELECCIÓN DE POSICIONES PARA AMETRALLADORAS. [Selection of positions for machine guns.] Lieutenant Macias

(20) URBANIDAD Y CORTESIA MILITARES. [Military customs and courtesies.] (II) Major Cravioto

(21) LA BATALLA DE JUTLANDIA. [The Battle of Jutland.] Admiral Von Schoulz

(22) EL PROBLEMA DE LA GUERRA EN EL MAR. [The problem of war on the sea.] (I) General Garza

June 1935

(23) LA GUERRA EN EL CHÁCO. [The War in the Chaco.] Lieutenant Farnsworth

(24) DOS MESES CON LOS AGUILUCHOS DE LA BUENA SUERTE. [Two months with the Eagles of good luck.] Colonel Hernández

This article describes the Observers Course with the 11th Squadron taken prior to the course in the Ecole Superieure de Guerre in Paris. It gives a very good description of the methods of navigation and the various missions and requirements which an observer must complete in order to receive his certificate.

(25) EL PELIGRO AÉREO. [Aerial danger.] Captain Gurza

(26) CONSIDERACIONES ACERCA DE LA IMPORTANCIA QUE REVISTE EL ESTUDIO DE LA GEOGRAFIA MILITAR. [Considerations regarding the importance of the study of military geography.] Lieutenant Martinez

(27) DESCRIPCIÓN SIMPLIFICADA DE LA AMETRALLADORA LIGERA SISTEMA "MADSEN." [Simplified description of the light machine gun, "Madsen" type.] Lieutenant Macias

(28) URBANIDAD Y CORTESIA MILITARES. [Military customs and courtesies.] (III) Major Cravioto

(29) EXPLOSIVOS Y PÓLVORAS CON Y SIN HOMO. [Explosives and powders with and without smoke.]

(30) PROBLEMA DE LA GUERRA EN EL MAR. [The problem of war on the sea.] (II) General Garza

REVUE DE L'ARMEE DE L'AIR (France)

By Lieutenant Colonel C.H. Wash, Air Corps

April 1935

(1) PRINCIPES DE LA DOCTRINE DE DOUHET. [Principles of the Douhet doctrine.] Colonel Vauthier

Colonel Vauthier has just published a book entitled, "La doctrine de guerre du général Douhet," which is reviewed later in this issue.

This article is a reproduction of one of the chapters in this book, giving a brief analysis of the Douhet doctrine. It quotes freely from Douhet's writings from 1927 to 1929. It should be of great interest to the many who agree heartily with his major premise, that the "air" is the decisive domain in the next war, while disagreeing violently with his proposed method of achieving "mastery of the air."

(2) LA CHASSE DE NUIT PENDANT LA GUERRE 1914-1918. [Night pursuit during the War, 1914-1918.] Major Lucas

A spirited defense of night pursuit, ably documented. The author outlines French, British and German efforts to employ "pursuit" at night in conjunction with the antiaircraft service. The result of his study is not convincing. The war ended too soon to permit him to prove his point.

(3) LE REPÉRAGE ACOUSTIQUE DES AÉRONEFS.—MÉTHODES ET APPAREILS. [Sound ranging of aircraft methods and apparatus.](I)Lieutenant Léglise

A continuation of three previous articles on this subject.

(4) VOL SANS MOTEUR AVEC MOTEUR. [Glider flight with motor.] Thoret

An article on sailing flight by an old master, who if memory doesn't fail, inaugurated this system of gaining altitude in a favorable locality, under power and after killing the engine remaining aloft for hours in sailing flight. His arguments for the value of this process are strangely reminiscent of the argument which keeps alive free ballooning. It is excellent sport and it trains pilots to handle their craft when engines fail.

(5) LE MATÉRIEL DES AVIATIONS NATIONALES. [Aviation equipment of various nations.]

May 1935

(6) D'AGADIR À DAKAR PAR L'EST DU RIO-DE-ORO. [From Agadir to Dakar along the eastern boundary of Rio-de-Oro.]

An illustrated account with maps of an aerial route in French West Africa.

(7) CONTRIBUTION ITALIENNE À LA NAVIGATION AÉRIENNE ASTRONOMIQUE. [An Italian contribution to aerial celestial navigation.] Captain Bastide

A review of a study by the Italian professor, G. Severino, on his tabular method of determining the position of aircraft in flight.

(8) D'AUTRES IMAGES DE LA CHASSE: 1915-1918. [More memories of "pursuit," 1915-1918.]

(9) LE REPÉRAGE ACOUSTIQUE DES AÉRONEFS.—MÉTHODES ET APPAREILS. [Sound ranging of aircraft, methods and apparatus.](II)Lieutenant Léglise

A continuation of previous articles on the same subject.

(10) CHASSE DE NUIT: MONOPLACE OU BIPLACE? [Night pursuit, monoplace or biplace.] (I) Lieutenant Gaulmier

The author gives his opinion of the relative merits of single-seater and two-seater pursuit airplanes for night pursuit work and decides in favor of the bi-place.

(11) LA MESURE DE L'ALTITUDE ET DE L'INCLINAISON DES AVIONS PAR LA MÉTHODE DE L'ÉCHO. [Determination of the altitude and inclination of aircraft by the echo method.] Delsasso

This article is a French translation of an article by Mr. Delsasso of the California Institute of Technology which appeared in English in an American technical magazine.

(12) GAS D'ÉCHAPPEMENT ET AUTRES PRODUITS DE COMBUSTION DES MOTEURS D'AVIATION.—EFFETS SUR L'HOMME. [Exhaust gases and other products of combustion in aircraft motors. Their effects on personnel.] Major Grow, U.S. Army

A translation from the Air Corps Information Circular No. 694, 10 July 1934 (U.S. Army Air Corps).

(13) LE MATÉRIEL DES AVIATIONS NATIONALES. [Aviation equipment of various nations.]

June 1935

(14) LES CONSÉQUENCES DE L'INTERVENTION DE L'AVIATION DANS LA PROTECTION DES COMMUNICATIONS MARITIMES. [The importance of the use of aircraft in the protection of maritime communications.] Ensign Accart

The author discusses the different methods of protecting commercial maritime routes used in the late war and compares the relative efficiency

of aircraft and surface craft in this work. He concludes by recommending that two autogiros and two seaplanes (to be launched by catapults) be assigned to each convoy or to each large steamship in case the latter operates alone. The aircraft are to be armed and perform both reconnaissance and bombing missions against hostile submarines and surface craft.

(15) LA NAVIGATION ASTRONOMIQUE ET L'AVIATION. [Celestial navigation applied to aviation.] Captain Guyot

The author argues that celestial navigation is now an essential element in the training of all navigating personnel and urges the improvement and simplification of both instruments and processes, in order to obtain greater speed and accuracy in the employment of this method of navigation.

(16) CHASSE DE NUIT: MONOPLACE OU BIPLACE? [Night pursuit, monoplace or biplace?] (II) Lieutenants Gaulmier and Barjot

A continuation of the discussion between Lieutenants Gaulmier and Barjot as to the relative merits of these two types for night pursuit.

(17) L'AMÉNAGEMENT DU RANDOLPH FIELD. [The installations of Randolph Field.]

A series of photographs of the U.S. Army Air Corps Primary Flying School at Randolph Field, Texas.

(18) LE MATÉRIEL DES AVIATIONS NATIONALES. [Aviation equipment of various nations.]

REVUE D'ARTILLERIE (France)

By Captain M.D. Taylor, Field Artillery

April 1935

(1) L'ARTILLERIE DIVISIONNAIRE DANS LE COMBAT DÉFENSIF. [Division artillery in the defense.] (I) Lieut.-Colonel Moustey

Abstract of this article will appear in the next number of this publication.

(2) LE TIR DANS LE GROUPE. [Fire by the battalion.] Chef d'escadron Maire

This article is another reply to the reactionary opinions expressed in the January number of the "Revue d'Artillerie," where it was suggested that the tendency to make the battalion the unit of fire rather than the battery had been carried to an extreme. The author, arguing in favor of the battalion, points out that the artillery methods of today are no longer those of 1914. The artillery must be able to strike quickly and accurately any targets within the range of its weapons. Very frequently, the individual batteries will have neither the time nor the observation facilities to execute a preliminary registration. Or registration by all batteries may endanger the secrecy of the tactical operation as well as the safety of the batteries. At such a time, it is obviously the duty of the battalion to organize the observation, to control the adjustments and to dissiminate the information obtained. Such an organization does not reduce the activity of the battery commanders but merely directs their activity for the benefit of the whole battalion.

(3) TRANSPORT DE TIR EN PORTÉE. [Obtaining the range in a transfer of fire.] Lieutenant Froidevaux

A simplified method of obtaining the range in a VE transfer.

(4) LE IIIE CORPS D'ARMÉE BAVAROIS DEVANT LE GRAND COURONNÉ DE NANCY. [The Bavarian III Corps in front of Nancy.] Colonel Chappat

This article is a translation of a part of the work, "From Nancy to the Camp of the Romans," by General von Gebsattel, who commanded the Bavarian III Corps in 1914. The period covered extends from 24 August to 11 September. During this period the corps faced Nancy between the Seille and the Meurthe with the mission of protecting the flank and rear of the Sixth Army which was advancing south against the communications of the French troops, invading the line of the Vosges against the German Seventh Army. The troops of von Gebsattel attacked on 25 August the elements of Castelnau's Second Army which were defending Nancy. In the succeeding days, the fighting was hard and costly with

small gains being made on either side. Although unable to gain an important success, the Germans fulfilled their mission of covering the Sixth Army. Von Gebsattel mentions the following lessons and impressions from the fighting about Nancy:

(a) The French artillery was the greatest enemy of the Germans. Its effects were particularly demoralizing on the second line troops which composed Gebsattel's command.

(b) At all headquarters, unsufficient time was given to the distribution of orders. It was necessary to learn how to use warning and fragmentary orders.

(c) The German artillery was deficient in that it did not know how to cooperate with aviation, and had insufficient telephone equipment. The high artillery commanders were not in agreement as to the use of the heavy artillery, when to attach it to lower units and when to hold it out.

May 1935

(5) LA DOCTRINE DE GUERRE DE DOUHET. [The doctrine of war of General Douhet.] Lieut.-Colonel Rousseau

This article, a brief survey of the Douhet doctrine, is inspired by the appearance of Colonel Vauthier's new book, "La doctrine de guerre du Général Douhet." Douhet advocates, in brief, a defensive attitude by the ground forces of Italy while a strong offensive is launched in the air. As this offensive must be of maximum strength, an absolute minimum of air force should be diverted to secondary, defensive missions. The primary objective of the offensive air force is the hostile air force on the ground as well as its airdromes, ground installations and factories. After finishing off the hostile air force, our own will turn on the enemy's industrial system, disrupt it and thus end the war.

Colonel Rousseau does not take definite sides for or against the Douhet doctrine. However, he makes the following observations:

(a) The Douhet doctrine was designed for Italy. The reasoning behind it may not apply to the needs of another country.

(b) The great air offensive presupposes a successful defense of ground frontiers. Can this be assumed? Since Douhet wrote, the appearance of mechanized forces has made the problems of the defense much more difficult. Who can now guarantee that his ground defenses can not be penetrated?

(c) The struggle between the opposing air forces threatens to be so destructive that the victor will not have sufficient strength to exploit the air advantage won at a high cost. The enemy's industrial system will thus escape effective damage.

(6) LE TIR DES BATTERIES CONTRE LES CHARS DE COMBAT. [Fire of field artillery against tanks.] General Fournier

A technical study of antitank fire.

(7) L'ARTILLERIE DIVISIONNAIRE DANS LE COMBAT DÉFENSIF. [Division artillery in the defense.] (II) Lieut.Colonel Moustey

Abstract of this article will appear in the next number of this publication.

(8) EMPLOI DE LA ROSE DES VENTS POUR LA RÉSOLUTION DES PROBLÈMES DE TOPOGRAPHIE EXPÉDIÉE. [Use of the component diagram in the rapid solution of topographical problems.] Lieutenant Cogny

June 1935

By Captain F.J. Tate, Field Artillery

(9) L'ARTILLERIE LOURDE DE CAMPAGNE AU XVIIIe SIÈCLE (DE VALLIÈRE À BONAPARTE). [Heavy field artillery in the eighteenth century, from Vallière to Bonaparte.] General Apffel

This brief article reviews the development of the heavier cannons of the field artillery during this period. It relates the attempts made to increase the mobility of the heavier weapons, and shows the gradual trend towards the light field gun, in order to obtain greater mobility. It also cites several examples of the employment of heavier guns in famous battles of this period to prepare the attack, and quotes the views of such com-

manders as Griebeauval, Frederick II, Napoleon and others, relative to the effectiveness of these guns.

(10) LE TRANSPORT DES MUNITIONS PAR VOITURES AUTOMOBILES. [Ammunition transportation by trucks.] Colonel Thierry

The author opens his discussion by stating that, in time of war, the requirements in personnel and matériel for transportation of ammunition by motors will be very great. He then proceeds with a discussion of methods by which this heavy demand on man power and matériel might be reduced, using as an example the case of vehicles employed in making a series of round trips between the loading point and unloading points.

This article should be of especial interest to officers who are mathematically inclined and who are concerned with logistics problems.

(11) L'ARTILLERIE DIVISIONNAIRE DANS LE COMBAT DÉFENSIF. [Division artillery in the defense.] (III) Lieut.-Colonel Moustey

Abstract of this article will appear in the next number of this publication.

(12) LE PROBLÈME GÉNÉRAL DES COUPS FUSANTS HAUTS. [The general problem of high burst firing.] Captain Tardi

REVUE DE CAVALERIE (France)

By Lieutenant Colonel N.B. Briscoe, Cavalry

March-April 1935

(1) LES UNITÉS MOTORISÉES DANS LA PACIFICATION DE L'ANTI-ATLAS EN 1934. [Motor units in the pacification of the Near Atlas country in 1934.] (I) Colonel Burnol

The author commanded the motor group of an expedition of all arms and includes in his article a number of photographs and maps. The photographs show a country of steep slopes with little or no verdure, the valleys having some tree growth. A photograph of an overturned truck, however, shows a good graded road.

The article starts off with quite a long quotation from the report of the field commander in Morocco, who estimated the 40,000 enemy population to have 10,000 modern rifles. This population consisted of two groups, the sedentary Near Atlas people and the nomads of the Sahara.

The preliminary operations consisted of: (a) making contact and of establishing bases of departure; (b) a frightful march by the eastern group leading to the dislocation of enemy force; (c) an exploitation involving the encircling of the remaining dissident tribes.

He organized two groups, one of great fire power and strength, and the other of great speed, cavalry and infantry in trucks.

The author's own account describes the country and the political situation. Aerial photographs had been made of the whole area and a preliminary reconnaissance by armored cars demonstrated the probable practicability of travel by truck, though no roads existed except mule trails.

"At the start of each bound a reconnaissance element was pushed forward by surprise to find the most favorable zone of advance." (Armored cars)

Next came crews to arrange crossings for the trucks.

The next day the column made its bound.

Then the road work had to be improved for the supply columns. Much of the infantry strength was used in guarding these routes and columns.

They moved about 75 miles in 8 days—no combat.

In the second phase the fast group moved about 125 miles in 5 days, without the loss of a vehicle, and hauling water 25 miles at times.

Quite a detailed and extremely interesting account is given of the organization and matériel—an advance guard of cavalry; main body of infantry in trucks and artillery; motorized medical troops and field trains; a rear guard of infantry in trucks; the commander behind the platoon at the head of the advance guard.

Maneuvers to reduce disputed points are explained and the acconut is carried by daily happenings.

(2) PUISSANCE ET MOBILITÉ FACTEURS DE MANOEUVRE. QUELQUES LECONS DE LA GUERRE MONDIALE. [Power and mobility—factors in maneuver. Some lessons from the World War.] Colonel Argueyrolles

The author wrote the series published in 1934 under the title, "Gouvernons vers le Large," and in this article asks and answers the following questions:

Is it necessary to admit, as some claim, that it is utterly vain to hope today to succeed in piercing the security system covering the flanks of every important force?

Is it true that, even in case a mechanized force reaches the communications of the adversary in the course of the battle, the effects of this event will in general be of only negligible importance to the issue of the main action?

Is it correct, in conclusion, to propound a principle that, as long as the victory is not assured, the large rapid mechanized units will be exclusively used to stop gaps in the line side by side with the other arms on the field of the principal action?

The author's answers are illustrated by historical examples with sketches of the maneuver in each case.

(3) LA CAVALERIE RURALE EN FRANCE (II). LES SOCIÉTÉS HIPPIQUES RURALES, LEURS PREMIÈRES MANIFESTATIONS EN FRANCE. [Rural cavalry in France.] (II) Miquel

This is the second article of the series and discusses the "rural horse societies and their beginnings in France," organized 25 July 1934.

The author discusses various phases of organization and of holding demonstrations and shows. The photographs show riders of all ages, and the games (musical chairs, spearing rings, etc.), and each group has guidons, trumpeters, leaders, etc.

The idea is a combination of a remount service, the riding club, the district horse show, and the gymkhoua—all to the end of an officially guided and backed interest in horsemanship and horsemastership.

(4) AMBIANCE D'UN COMBAT VU À L'ÉCHELON COMPAGNIE OU ESCADRON À PIED. [The sequence of a battle from the viewpoint of the company or dismounted squadron.] (II) Captain Guérin

The author continues the battle started in the previous installment and from a strength at midnight (the 7th) of 4 officers and 180 men, was reduced by 4:00 AM (the 11th) to 1 officer and 16 men.

The account is detailed, written by a participant, and is most interesting as a study.

(5) LA GUERRE EN AFRIQUE. [The war in Africa.] (II) Captain Licart

In this second installment the author states that the object of this warfare is not to kill the adversary but, after subduing him by force, to conciliate him.

Instructions and discussions are given to teach newly arrived officers how to deal with natives and the country.

"The best guarantee of success is a vigorous offensive in force."

"Guard against surprise and retain the initiative and freedom of movement in all circumstances."

"This warfare is not a warfare of masses but one of small detachments in an immense country."

It is interesting to read the French idea (and American and British) of warfare against nomads. Strange as it may seem, the French are learning and practicing today what our army did fifty to one hundred years ago.

(6) LES TRANSMISSIONS DANS LA CAVALERIE. EN MARGE DU RÈGLEMENT. [Communications in the cavalry. Notes on the regulations.] (III) Captain Becquey

The third of a series reaches the cavalry division on the defensive and discusses lines to observation posts, command posts, for alerting and informing different parts of the command.

Great stress is laid on telephones, of which many more are present than in our cavalry.

Two things must be remembered in reading of French maneuvers and equipment: they expect to fight in thickly settled country in large compact masses, and the country is not nearly so well wired for communications as our country.

REVUE D'INFANTERIE (France)

By Captain Wendell G. Johnson, Infantry

April 1935

(1) RÉFLEXIONS SUR LE CHEF. [Military leaders.] General Gamelin

In a lecture given by General Gamelin, Inspector General, Chief of Staff, and Commander-in-Chief of the French Army, before an assembly of the National Reserve Officers' Association at the Sorbonne, he includes the following:

What are the necessary qualities of a military leader? How can they be acquired, or perfected? Certain natural gifts are, of course, necessary. The great conquerors reached the summit of their art immediately, gaining individual power as well. Such were Alexander and Napoleon, and to a less degree, Condé. The development of their genius might be studied but it would be presumptous to try to embrace the origin in any formula. On the other hand, we might logically take Turenne as a model of one who raised himself by successive stages and by the experience of combat to the peak of military eminence. However, in modern armies officers do not and cannot become qualified to conduct armies with all their complex structure, except through long years of study.

The activity of the soldier differs from that of the writer, artist, or sage, and also from that of a government official. The business or professional man has at stake only his reputation or fortune or that of others who have confided in him. The official of the State and the military men are accountable for national interests. However, the intentions of the adversary are much more uncertain for the military leader than for the civil official. In the same degree the exigencies of time are less tyrannical for the government leader. Moreover the head of a military unit must accept, generally speaking, his subordinates as they are assigned, whereas the government head can to a considerable degree select his collaborators. Since the army chief must place the execution of his will in the hands of relatively unknown subordinates, it is essential that all the military men have a common understanding of the military art. The government leader need not be a specialist; the military leader must be highly specialized in his profession.

With these and other observations General Gamelin introduces his subject. As requisite qualities for the military chief he lists professional knowledge, professional conscience, firmness, spirit, creative power, and willing consecration to duty.

The essential qualities can be acquired through the various military schools and other instructional systems, accompanied by personal effort on the part of the student; and through constant practice and experience, particularly in association with capable superiors whose methods can be studied. General Gamelin summarizes by giving the following suggestions for improving oneself:

(a) Reading and making notes, carefully weighing what is read.

(b) Seeking action and command, while examining oneself for faults and asking the criticism of superiors.

(c) Tasting stress and effort, and, if possible, triumph.

(d) Learning the value of words and the worth of silence.

(e) Travel.

(f) Accustoming oneself to suffer danger, difficulties, and contrarieties without complaint, especially before subordinates.

(g) Self-confidence without conceit.

(h) Requiring obedience and loyalty of subordinates.

(i) Criticizing when criticism is due and praising when commendation is merited. Joffre said, "When I read the remarks on officers I judge the markers as well as the marked." By our acts shall we be judged.

(j) Learn to state their desires specifically but listen to observations when they are respectfully made.

(k) "To command is to foresee." One must carefully weigh a matter before coming to a decision. Having given an order one must, while checking its execution, think of the possible consequences and the necessary further actions that may be necessary according to the development.

(l) Be not dominated by and subservient to the technical factors of modern war.

(m) Avoid attempting to do everything personally. In time of peace, particularly, use the initiative of subordinates by giving them all authority possible.

(n) If the leader wants to know how to do everything, he must know how to make others do things.

(o) The leader must be able to talk, though not necessarily as an orator.

(p) The leader must avoid affectation.

The supreme law of military men should be "action"; action without agitation.

(2) LES ITALIENS À VERDUN. [The Italians at Verdun.] Major M....

(3) EMPLOI DES CHARS RENAULT F.T.: ETUDE D'UN CAS CONCRET. [Employment of Renault F.T. tanks.] (I) Lieut.-Colonel Michoux

(4) LE FANTASSIN ALLÉGÉ. [The disburdened doughboy.] Lieut. Colonel Favatier

A discussion of the reduced load of the infantryman and the results of the removal of part of his equipment.

(5) EXERCICES SUR LA CARTE ET TRANSMISSIONS. [Map problems and communications.] Lieutenant X....

Improvisations for simulating conditions of warfare and communications during map exercises.

(6) ITALIE: LE COMBAT EN TERRAIN BOISÉ. [Italy: Combat in wooded terrain.]

The Italians are especially interested in woods combat inasmuch as they must expect to operate largely over wooded terrain during any future war. On their eastern frontier are extended stretches of wooded areas; and on their western frontier, wooded mountains.

During the last war the tactical possibilities of wooded zones proved to be as beneficial to the attack as to the defense. For example, in July 1918, the French were able, on the front of Villers-Cotterêts, to conceal from the enemy eleven infantry divisions, two of cavalry, eleven tank battalions, and over one hundred artillery batteries.

The Italian author makes several interesting comments on the advantages and disadvantages of wooded zones. In the first place maps give too little information to be depended upon, hence recourse must be had to other means, such as airplane photographs, employment of guides, and the information supplied by inhabitants.

In woods, aviation can only discern smoke and works in cleared areas or ones poorly camouflaged. However, if the leaves are gone, the terrain and troops are seen as through a veil. On the other hand, at night, woods present obscure masses easily recognizable and thus constitute objectives easy to mark and to bombard from the air.

Tanks can sometimes maneuver in forests if they are not too thick. In thickets they risk falling into traps.

Combat in woods, generally speaking, is similar to guerrilla fighting, against which troops must be morally and technically prepared.

The offensive.—During the approach and gaining of contact, the maintenance of direction is difficult in woods owing to the tendency to follow roads, trails, ridges, or valleys. The advance, therefore, must be made by successive bounds with a check of direction between each bound.

In areas subject to artillery fire halts must be avoided at crossroads, openings, and exposed points.

Every effort must be taken to conceal forces from aerial observation and to rapidly discover gassed areas.

When a meeting with the enemy can be foreseen, the initial disposition (small columns preceded by patrols) will transform itself into a formation presenting a continuous line of dense fire, well covered on its flanks.

Italian regulations on the employment of large forces prescribe that "isolated units operating in woods in the proximity of the enemy should employ, according to the situation, open or closed formations, but always such that they are ready for combat in any direction. Fire support will be decentralized. Strong patrols will cover the front, flanks, and rear."

Combat in woods develops rapidly. Only the arms in the firing line can be put into action in sufficient time. It is advisable, therefore, to distribute ahead of time the heavy machine guns among the rifle companies.

As always, but particularly in combat in woods characterized by the uncertainty of the situation, the constitution of reserves is essential to meet unforeseen events.

In studying the attack in woods the author considers two cases: extended woods and isolated woods of little extent.

Attacking through extended woods:

(a) Against an enemy in march, to take rapidly a combat formation and attack without hesitation. The attack must be sustained by a short but intense fire action during which grenades should be used.

(b) Against an enemy in position, to act with caution and seek first to determine emplacements of hostile automatic weapons and obstacles. If the hostile force seems to be weak, to attack without delay in small columns supported by accompanying weapons (principally flame throwers, grenade throwers, and mortars). If, on the contrary, the hostile force seems solidly established, to await the aid of tanks and artillery.

Attacking isolated woods of little extent:

(a) Artillery and gas alone can render such woods untenable by the enemy. According to the Italian regulations, such woods can and should be avoided ordinarily during movements, merely keeping them under close watch; or, better, to shell them with artillery until the completion of the maneuver that should make them fall.

(b) But if attack is imperative, to avoid a simple frontal attack, seeking preferably a combined frontal and flank attack. Units attacking by the flank must be echeloned in depth. After the attack, the delay of reorganization necessitates the use of other units for exploitation and pursuit.

The defensive.—Defense of a large wooded zone:

The main line of defense may be along the edge of the woods or within the woods. The edge is not advisable except in particular cases, for example, an outpost line from which the enemy can be taken under long range fire.

The defense within the woods has the advantage of concealing the force from the enemy. On the other hand, visibility and fields of fire are limited for the defenders. This fact requires more guns to be used in the firing line and necessitates several successive lines of defense. The result is more men are required.

The uncertainty that characterizes combat in woods effects the spirit of the infantryman. Morale is stimulated by making the lines as continuous as possible and the flanks strong.

Lines through the woods should have re-entrants and salients, which, in addition to permitting cross fire, has the advantage of putting the enemy on the wrong scent. Obstacles should be fully used, particularly barbed wire, which is easily set up in woods. The backbone of the system will be composed of several centers of resistance surrounded by entanglements.

Defense of an isolated woods:

A small, isolated woods is a veritable nest for projectiles and should not be defended either within or along the edge. But if it is an isolated woods of considerable size, the ideas expressed in the paragraph above are applicable. Moreover, to avoid being turned or passed by the enemy, positions should be sought from which fire can be brought on the flanks and exits of the woods.

The positions covering the exits should be established to the rear and outside of the woods. They should be garrisoned by reserves independent of local reserves, which are held for immediate counterattack.

Instruction of troops.—In Italy wooded terrain is available near all garrisons for troop training. Exercises dividing the troops into opposing forces are especially instructive in combat in woods. Such exercises accustom men to conquer their fear of isolation, serve to test initiative and decision, and train all grades to rapidly utilize their weapons, notably grenades and the bayonet.

Scouts (patrols) must be carefully trained. Woods combat requires a large number of patrols, which are difficult to lead. Patrols must push farther ahead in woods than in the open.

Radio may be very useful in combat in woods, but dependence must usually be placed in runners, who must be well trained.

(7) ITALY: LA FORTIFICATION DE CAMPAGNE DANS LA COUVERTURE. [Italy: Field fortifications for forces covering mobilization.] (Resumé of article by Major Mario Montanari, Engineer Corps, Italian Army, in "Revue Italienne de l'Artillerie et du Genie," November 1934.)

This article discusses the different methods of fortifying frontiers to cover mobilization as required by European nations.

(8) SUÈDE: UN NOUVEAU CHAR SUÉDOIS ET UN NOUVEAU PÉRISCOPE. [Sweden: A new Swedish tank and a new periscope.]

The Swedish firm "Landsverk" has produced a new medium tank called the "Landsverk 10." The following characteristics are given by the French reviewer: weight, 10½ tons; length, 5.2 yards; width, 2.15 yards; height, 2.22 yards; horsepower, 200; crew, 4; ascends slopes of 40 degrees, crosses trenches of 1.8 yards width; fords 1.2 yards; radius of action about 85 miles. Its armament consists of a 37-mm. cannon dual mounted with a machine gun under the turret and another machine gun in the forward wall of the tank. 150 shells and 3,000 cartridges are carried. The maximum thickness of the armor is 14 millimeters.

On the roof of the turret a revolving periscope is placed filling the role of a telescopic sight as well as ordinary means of vision.

An armored cupola, placed in the forward part of the tank, protects the head of the driver and has vision openings protected by blocks of shell proof glass.

(9) ANGLETERRE: ACTIVITÉ COMPARÉE DES CHARS ANGLAIS ET FRANCAIS DURANT LA GUERRE 1914-1918. [Great Britain: A comparison of British and French tank employment during the World War.]

This article brings out the fact that there were 3,000 engagements of British tanks and 4,300 of French tanks during the War; further, that between 2,600 and 2,700 British tanks were manufactured, and 3,850 French tanks, of which 3,473 were delivered to the armies before 11 November 1918.

(10) LES ARMÉES DES PAYS BALTES. [The armies of the Baltic countries.]

A table is given showing the statistics on the strength and equipment of the Esthonian, Latvian, Lithuanian, and Finnish armies. These four countries have, in peace time, armies of 13,500, 20,000, 17,800, and 25,500 men, respectively.

(11) COMMENT SE RENSEIGNER SUR L'ARMÉE ALLEMANDE. [How to obtain information on the German Army.]

Seven pages are devoted to listing articles that have appeared in various French magazines during the past seven years, covering the German Army.

May 1935

(12) L'ECOLE DE GUERRE. [Ecole Superieure de Guerre.] Marshal Pétain

(13) L'INFANTERIE AU RALENTI. [Approach marches.] Lieut.-Colonel Hurst (See abstract, page 101)

(14) ECOLE SUPÉRIEURE DE GUERRE—CONCOURS DE 1935. EPREUVE D'APPLICATION TACTIQUE. UN ESSAI DE SOLUTION. [Ecole Supérieure de Guerre competitive examination of 1935. Test of tactical employment. A sample solution.]

(15) LES TRANSMISSIONS DANS LA MANOEUVRE EN RETRAITE. [Communications during a withdrawal.] Lieut.-Colonel T. . . .

A discussion of communications based on the withdrawal problem presented in the February 1935 issue of "Revue d'Infanterie."

(16) EMPLOI DES CHARS RENAULT F.T.: LES CHARS DANS LES AVANT-GARDES DES CORPS D'ARMÉE, ÉTUDE D'UN CAS CONCRET. [Employment of Renault F.T. tanks. Employment of tanks in the advance guard of an army corps.] (II) Lieut.Colonel Michoux

A map problem concerning the operations of a battalion of Renault tanks (operating with a corps), moving, partly under their own power and partly on tank carriers. The exercise is presented essentially as a problem of logistics, supply, and communications and is replete with orders. Tank tactics are not discussed.

(17) UN TRI-RAPPORTEUR POUR LE FANTASSIN. [A triple protractor for the infantryman.] By Z. . . .

The Lhote triple protractor is considered of inestimable utility for the infantry officer and noncommissioned officer. It is minutely graduated on celluloid and is accompanied by instructions. It can be carried in the pocket.

It can be used to: (a) express in any unit an angle measured in percent of slope, mils, or degrees; (b) determine accurately the bearing of a direction; (c) measure the angle of slope of a road or the altitude or angle of site of a point; (d) determine range; (e) facilitate the making of panoramic sketches; (e) determine the coordinates of a point on a map; (f) serve as a stadia for measuring distances.

(18) ANGLETERRE: LES TRANSFORMATIONS DE L'INFANTERIE. [Great Britain: The transformation of the infantry.] Lieut.-Colonel Cazeilles

Two schools of thought are now current on the organization of the infantry battalion. First, that which considers modern infantry too heavy because its machine guns are an organic part of the battalion—the criticism of the French organization. The belief of this school is that the combat of such a unit becomes too methodical and stiff, which hinders the initiative of the rank and file by preventing them from exploiting the opportunities of the battlefield.

The second school believes that infantry combat requires considerable fire power; this school demands, therefore, that all the necessary means be allotted to the battalion so that it can carry on the fight from beginning to end.

The British are probing this problem to its depth with a view to improving mobility and maneuver. The present tendency, in the experiments now in progress, is to reduce the personnel of the division by increasing the automatic arms and improving mobility. The light artillery pieces are to give way to the infantry mortar. Motorization of the division will permit a reduction of 1,000 men for which tank support and an increase in automatic arms compensate.

If the results of these tests are conclusive, the new British brigade will consist of three rifle battalions (with automatic rifles and mortars) and one support battalion (with heavy machine guns and antitank weapons). Trains will be motorized.

Rifle battalions will have five companies; four of riflemen and one of mortars and antiaircraft weapons. Each company will consist of four platoons of three groups each. The support battalion will have three machine-gun companies and one antitank company.

Colonel Cazeilles discusses the advantages and weaknesses of this organization. A brief of his comments follow.

The assignment of four mortars to the battalion augments the offensive possibilities of this unit but this number is still insufficient, particularly in a war of movement on wide fronts.

Battalions should not be deprived of machine guns on stable mounts. Having machine guns and antitank weapons as brigade means may, in an attack, cause a part of this armament to remain unutilized.

The battalion is the true combat unit and it seems that it should have the combination of fires, which, of course, should not exclude the effort toward increased maneuverability and mobility.

The formula for the battalion, the author believes, is as advocated in the "Revue d'Infanterie" of September 1933. That organization gave the battalion 5 companies; 4 rifle companies and 1 support company, which had 8 mortars, 8 machine guns, and antitank guns. The antiaircraft guns pertained to a higher echelon.

The British plan is very similar. In all probability the brigade commander would distribute a part of his machine guns among the rifle battalions. In that event they would perhaps come under the orders of the commanders of support companies.

The author anticipates the objection that may be raised to his proposed plan of being too cumbersome an organization, by contending that if each rifle company had 3 platoons it would have ample maneuver possibilities.

He contends further that the battalion of 4 rifle companies offers even greater possibilities in open warfare, where it is necessary to have strong reserves. The habitual disposition would be a square formation, allowing 2 rifle companies to be maneuvered by the battalion commander.

(19) ANGLETERRE: LE CHAR MOYEN WICKERS MARK IV. [Great Britain: Vickers medium tank, Mark IV.] Captain Le Gouest

Notable features of the new British tank are: crew, 4; armament, one 40-mm. gun, one 25-mm. gun, and 1 machine gun; maximum road speed, 28 miles per hour; radius of action, 100 miles; crosses trenches of 1.8 yards width, streams of 1.2 yards depth, vertical walls of 0.76 yards height. It is provided with a periscope and seemingly is protected from gas.

June 1935

(20) FICELLES ET GIBERNES. [Tricks of the trade.] General Clément-Grandcourt

The author presents an exposition on various subjects of the military profession. The advice and the reasoning therefor which he gives contains many points worthy of thought. For example, under his topic XVIII he states: "Proportionner la manoeuvre au talent des exécutants et non pas seulement à celui du chef, telle est la suprême sagesse du chef." [To adapt the maneuver to the ability of the doers and not merely to that of the chief, that is the supreme good judgment of the chief.] Also: "The length of trench warfare and the predominance of technique have brought about the loss of the understanding and import of maneuver in the army of today."

(21) RÉFLEXIONS SUR LA DÉFENSIVE DEVANT LES CHARS EN GUERRE DE MOUVEMENT. [Thoughts on the defense against tanks in a war of movement.] General Barrard

The author sums up his discussion of organizing the defense to counter mechanized attacks by the following points:

(a) To exploit fully all "coupures" (cuts, watercourses, etc.) and localities that are not traversable by tanks, or to allow time to construct passive obstacles.

(b) In zones passable by tanks to increase the depth of the position; not limit the artillery to one narrow barrage of fire; deceive the enemy on the real barrage areas.

(c) Not to rely on the delaying action of screens (outposts and delaying forces) that are not based on impassable obstacles.

(d) To give tanks to the defense.

(e) To reduce the width of zones of action of units of the defense; to increase the depth of infantry cannon dispositions; or to augment temporarily the allotment of antitank and automatic weapons to these units.

(f) To facilitate the possibility of the intervention of reserves.

(g) Provide artillery and rear elements with antitank guns.

(h) To give infantry and all command grades a much more complete instruction in matters of defense (plan of fires, field fortifications, camouflage) and always give this instruction on the ground.

(i) Familiarize all concerned with practical passive preparation of the terrain, cover, and utilization of mine fields.

The reasoning of General Barrard to substantiate his summary merits full translation; a part, only, follows.

There must be less rigidity in the defense of a position, especially in the concentration of infantry and artillery fires in front of a main line of resistance. Against rapid attacks, strong in tanks, the defense must be flexible and maneuverable, and must put uncertainty into the scheme of maneuver and fires of the attacker, endeavoring to surprise him with the unexpected. Clearly, if the defense can deceive the attacker as to the disposition and extension in depth of the real position of resistance, and thus escape an effective preparatory neutralization, it will regain the advantages of defending.

In the army echelon, or one might say in the realm of strategy, the battle of 15 July 1918 in Champagne was a model of this maneuver in depth of the defense. It, of course, envisages a second position at a convenient distance in rear of the first, and therefore is particularly adapted to position warfare. It can be adapted to a certain degree, however, in a war of movement, provided several days are available for preparing the rear position and its rapid organization for defense.

In the sphere of tactics—divisions and smaller units—the defense has little chance of acting effectively on tanks in the principal barrage zone, bounded by the line of departure of the attacker and the main line of resistance of the defender, inasmuch as this is usually only about 400 yards in width. But if, before the attack, it were possible to extend backwards by 400 yards the principal barrage zone without changing the apparent contour of the position, that is, give the artillery and antitank guns a depth of 800 yards in which to engage the tanks, then indeed the situation would change for the defense.

Furthermore, within the position an efficacious maneuver would consist of an organization of interior barrages.

Finally, the ultimate maneuver of the defense is always the counterattack. By increasing the depth of the position, organizing tank obstacles in front of and within this depth, and strengthening the regimental reserve line, the counterattack would be easier to carry out. But in the face of tanks it would be foolhardy to attempt a counterattack without tanks, and especially tanks with cannons.

The possible rapidity of penetration of an attack strong in fast tanks, and the rapid maneuver of such an attack with a view to breaking the deadlock, demands on the part of the defenders a more rapid and flexible intervention of the reserves, expedited by its tanks.

In the opinion of the author, the entrance of tanks into the picture as a customary means of attack precludes the use of delaying actions conducted over wide fronts by weak forces. The number of antitank guns usable on such a front must perforce be very small, and as the defensive screen will lack depth, unless it is behind an absolute obstacle for tanks, it will be pierced immediately by the attack. The withdrawal of the defenders will become impossible, at least by day.

As for the defensive covering screens for a retirement, they are not likely to find strong natural tank obstacles except at wide intervals, and the only solution possible for them is to pass at night from one protected position to another with the idea of holding all day long on each position. This changes considerably the conditions of this operation, and will necessitate vast motorized means for the transport of troops from one line to another.

The author predicts in the next war an attempt by the adversary to seek a rapid solution, allowing the defender no time to organize defensive positions at leisure. He urges more instruction for the rank and file in the technique of organizing a defense and in the utilization of the terrain. The doctrines and methods of war must be adapted to the progress of the matériel; at present, to the inescapable menace of tanks.

(22) UNE AUTRE SOLUTION DU THÈME TACTIQUE PROPOSÉ AU CONCOURS D'ENTRÉE À L'ECOLE SUPÉRIEURE DE GUERRE. [Another solution to the tactical problem proposed in the entrance examination for the Ecole Superieure de Guerre, 1935.]

(23) EXERCICES EN SALLE DE TRANSMISSIONS. [Classroom exercises in communications.] Lieut.-Colonel X. . . .

(24) EMPLOI DES CHARS RENAULT F.T. ROLE DU GÉNÉRAL COMMANDANT LES CHARS D'UNE ARMÉE DANS LA PRÉPARATION DE LA BATAILLE D'ARMÉE. [Employment of Renault F.T. tanks. Role of the commanding general of the tanks of an army in the preparation for the army battle.] (III) Lieut.-Colonel Michoux

This entire series of problems has emphasized the technical and logistical side of tank operations, giving but slight attention to tactical problems. Each part has been replete with orders.

(25) ROUMANIE: LA DÉFENSE CONTRE LES CHARS DE COMBAT ET LES AUTOS BLINDÉES. [Rumania: The defense against tanks and armored cars.] General Jacobie

Preparations of the Soviets: It is well known that the Soviets are equipping their army with great numbers of tanks. A Soviet study considers 15,000 tanks as a necessary complement for 10 divisions. One battalion is considered the minimum support in armored vehicles for a division.

Russian tanks are not classified by their weight but rather by their employment.

(a) The reconnaissance tank, fast and lightly armored, is intended for exploration and pursuit, and constitutes the first mobile reserve of firepower preceding the counterattack.

(b) The accompanying and protecting tank (Renault-Rosskij) attacks defensive positions with infantry.

(c) The medium tanks for distant action are employed by battalions or regiments under division or corps orders. They penetrate the fortified lines and are supported by mechanized guns that accompany them individually from one position to another.

(d) The shock tank, heavy, powerful, and strongly armored, is not well known. It is certainly similar to the French 2C and will be used to make a breach in strongly fortified lines and to protect accompanying tanks.

(e) Armored cars are rapid vehicles of the model Austin, Fiat, and Garford.

The tactical employment of tanks resembles the American doctrine, viz.: a part of the tanks accompany the infantry; another, better armed and supported by artillery and aviation, operates against the reserve line; a third, composed of heavy shock tanks, attacks artillery and reserves.

Moreover, tanks are used with large cavalry and motorized units, to drive through the hostile screen, on flanking operations, or against the rear of a stabilized front.

Armored cars accompany advanced detachments, advance guards, and scouting detachments. They are used on flank actions and against the outposts of the adversary.

The digest of General Jacobie's article continues with a discussion of the defensive possibilities of the Rumanian Army against tanks and armored cars, considering present equipment and its effect on tanks and future antitank armament. The author believes essential four antitank guns, such as the 20-mm. Oerlikon machine gun, per battalion and one Gerlich type rifle per platoon, in order to effectively oppose tanks.

Lacking adequate equipment, artillery, machine guns, and rifles must be relied on together with a careful use of terrain and obstacles. Moreover, troops must be trained to meet tanks without fear. This can be done by instructing them in the limitations of tanks and the methods of attack employed by tanks.

The importance of obstacles in the defense against tanks is inversely proportional to the active means of defense; the weaker the weapons, the stronger must be the natural or artificial obstacles. Henceforth the plan of fires of the defense must favor antitank action. Fields of fire must be longer and the outline of the defensive position must follow steep slopes (which retard the advance of tanks) edges of woods, and tactical localities; the defensive position must avoid reverse slopes.

(26) ROUMANIE: ACTIONS OFFENSIVES ET DÉFENSIVES SUR LES GRANDS FRONTS. [Rumania: Offensive and defensive operations on wide fronts.] Colonel Potopeano

The author comments on the brevity of Rumanian regulations with reference to operations on wide fronts, delaying actions, and on the vast amount of material on that subject contained in German, Austrian, Russian, and Polish regulations.

The Austrian and German regulations define the objective of delaying actions as a system of alternate defending and withdrawing operations, designed to gain time and to spare their own forces in order to prevent the adversary from carrying out his intentions, but without eliminating the possibility of accepting on certain parts of the front an offensive or defensive combat.

Positions with long fields of fire, reinforced by obstacles, and provided with cover in rear, are chosen. Long range artillery and machine gun fire is indispensable. Automatic rifles and rifles are only employed to protect the installation and retirement of machine guns and artillery. The enemy of delaying actions is the armored combat vehicle against which artillery, especially, must be able to operate. Both regulations recommend the aggressive counterattack as the means to fix and deceive the enemy.

Soviet regulations insist, in defense, on the discontinuity of the resistence, the importance of reciprocal support, the action of shock groups placed in rear of the battle position, and the necessity of covering the intervals with fire or of infecting them with gas.

The extent of front that can be covered is, for the battalion, 2½ miles; for the corps, 35-38 miles. Field artillery and heavy artillery are assigned to regiments and even to battalions. The action is carried by the battalion which is transformed into detachments of all arms.

The role of front line battalions is to stop the enemy and then prepare the setting for the action of the shock groups, which attack concentrically against the enemy when he has penetrated into the position.

The Polish regulations prefer maneuver to rigid defense, which, however, it does not exclude from its teaching in order that initiative may be retained in operations. In mobile defense, the major part of the force is assigned to offensive actions and to counterattacks. Surprise, rapidity, energy, foresight, and fearlessness on the part of the commander are the indispensable conditions to success.

Active zones are reduced to the minimum by destructions and the creation of obstacles. It is often necessary to attack the enemy at the moment when he assembles his means in order to overthrow and annihilate him. Secrecy plays a large part in the action of the main body; it must not be moved prematurely.

As in the Soviet regulations, command, organization of groups, and the employment of decentralized artillery are prescribed.

All the regulations are unanimous in recognizing the important role that terrain plays in actions on wide fronts. Well utilized, it can control the action, and the commander must know how to make use of it.

(27) HOLLANDE: L'ACADÉMIE MILITAIRE DE BRÉDA. [Holland: The Military Academy of Breda.]

REVUE DU GENIE MILITAIRE (France)

By Lieutenant Colonel P.C. Bullard, Corps of Engineers

March-April 1935

(1) NOTE SUR LES ABATIS. [Notes on abatis.] General Abadie

In northern Syria, during 1920 and 1921, bands of irregular Turks, sometimes supported by artillery, frequently attacked our isolated posts. Some of these, in which the defensive organization of the ground was slight, due to lack of tools and materials, owed their salvation only to abatis which had been built of materials carried to the site and which constituted the only available accessory defense. The posts that were able to establish a line of abatis, even very thin, held out victoriously; most of the others succumbed. These lines of abatis were such that the weak artillery of the attacker was practically unable to destroy them; they were covered by the fires of the defenders, automatic weapons and gre-

nades; and all attacks, even the most furious, broke against them, by night or day. The defenders finally acquired complete confidence in their protecting abatis. These results, gained with the use of only thin abatis, shows that thick abatis would be very effective.

This study, omitting consideration of abatis composed of large trees, treats of abatis more nearly similar in utility to wire entanglements. It covers abatis in place, either live or ordinary, and abatis built of materials which are transported to the place where they are used. Though there are differences between these two types—that built in place, and that built of transported materials—they have certain characteristics in common.

They are difficult to destroy. They are not easily crossed by light tanks. They offer a very serious obstacle to the passage of infantry. They may obstruct the field of fire of the defender, and therefore require special measures in order to free this field of fire.

In woods the ordinary abatis is constructed by felling about three rows of trees so as to form an entangled mass, the branches pointing toward the enemy. The leaves are removed and branches are pointed. Felled trunks are left attached to the stumps. Such trees as are left standing tend to hide the abatis from aerial observation.

In brush or saplings, live abatis is used. These small trees and brush are bent down, interlaced, and wired with barbed wire. Continuing to grow, they continue to become more and more entangled.

At times a combination of ordinary abatis and live abatis is used.

The tactical placing of abatis presents difficulties, due primarily to the necessity of covering them with fire, which is necessary in order that they may be really effective. In woods, the trees interfere with the fields of fire, and the abatis itself also interferes. Flanking fires can be obtained, at times, by emplacing the weapons on high ground so that they can fire over the abatis, at times by cutting passages for the fire through the abatis, and at times by partly sinking the abatis into the ground.

Abatis built of materials transported to the place of use are used in cases in which materials are not found on the ground. This usually implies that the ground is open and that the abatis can be hidden only with great difficulty, if at all. It has, nevertheless, great value. The thickness of such an abatis should be about 30 to 40 feet, and its height about 6 to 10 feet. The trunks of the small trees used are fastened firmly to the ground. The effectiveness can be greatly increased by the use of barbed wire.

In addition to its use in other situations, the use of abatis should be very effective as a part of the permanent defenses ot the French frontiers. A study of a concrete case of such use is presented.

(2) ETUDE SUR LES TRANSMISSIONS DANS LA DIVISION DE CAVALERIE. [Study of signal communications in the cavalry division.] Captain Marty

This is a detailed study of a concrete situation. The author reaches three conclusions:

(a) The radio is the basis ot the signal communications in the modern cavalry division. The technician should endeavor to provide radio stations of great range, simple to operate, permitting wide choice of wavelengths, and capable of following the cavalry at any speed and of operating while in movement.

(b) The division signal officer has not an easy task. Knowing thoroughly the capabilities of his equipment, he must think and act quickly. He must demonstrate his ability as a technician, and especially as one who attains results. He should be present at the preparation of all tactical plans, sometimes exercising his influence, but always being among the first to know the plans.

(c) There must be close collaboration between the signal officer and the general staff, and not only this, but the operations of the signal communications require decisions of the commander himself. In order to secure the best results the commanders of all grades must exercise personal supervision.

(3) ENQUÊTE SUR LA RADIESTHÉSIE. OU EN EST LA RADIESTHÉSIE? [Inquiry into radiesthesia. What is the situation with respect to radiesthesia?] (II) Lieut.Colonel Correnson

Continuation of the study on the art of the well-finder.

May-June 1935

(4) PASSAGE DE VIVE FORCE DU CANAL DE L'YSER. [Forced passage of the Yser Canal, 31 July 1917.] Captain Simon

This is an account of the crossing of a narrow stream (canal) in the course of a limited objective attack of two divisions from a stabilized situation.

(5) L'ESCALADE DU TAGOUNTSA. [The escalade of Mount Tagountsa.] Major Michelet

Construction of mountain roads in operations in Morocco in 1933 against dissident tribes.

(6) ENQUÊTE SUR LA RADIESTHÉSIE. OU EN EST LA RADIESTHÉSIE? [Inquiry into radiesthesia. What is the situation with respect to radiesthesia?] (III) Lieut.Colonel Correnson

REVUE MILITAIRE FRANCAISE (France)

April 1935

By Captain M.D. Taylor, Field Artillery

(1) UNE OPÉRATION MODERNE EN AFRIQUE DU NORD (FÉVRIER-MARS 1934). [An operation in Northern Africa, February-March 1934.] Colonel Arlabosse

The operation described took place in the Anti-Atlas in the spring of 1934. Its successful termination marked the end of the pacification of Morocco. It is notable in that the principal rôle was played by highly mobile motorized elements, specialized in the type of warfare involved.

The plan of operation was as follows: General Catroux with 15 battalions of infantry, a battalion of tanks, 4 squadrons of cavalry, 15 batteries of artillery, and 6,000 partisans, was to advance from the Tiznit area southward against the front of the Anti-Atlas with the mission of fixing the dissident tribes in that area. General Giraud, with a force of 14,000 men, 4,700 animals and 400 vehicles was to turn the Anti-Atlas from the east, advancing in the direction: Akka—Bou Izakarin.

General Giraud divided his forces into two groupments, placing the most highly mobile units in the Trinquet groupment on the marching (south) flank. A Sahara detachment to the southeast was given the mission of protecting the flank. The Trinquet groupment which was to be the spearhead of the envelopment was constituted as follows:

4 squadrons of cavalry
2 armored car squadrons
3 battalions of infantry in trucks
1 regiment of Chasseurs d'Afrique (motorized)
2 battalions of artillery (portée with tractors)
2 Sahara companies
1 company of engineers
Signal personnel for wire and radio communications
Two squadrons of observation aviation. (Army bombardment aviation was available on call.)

After nearly two months of careful preparation, the Trinquet detachment began its advance on 19 February in conjunction with the remainder of the French forces. All resistance was quickly overrun. The rebels, deprived of their communications to the south, surrendered in great numbers. The operation ended early in April. Rapidity of movement and the effect of surprise made the conquest of the Anti-Atlas easy and inexpensive for the French.

This was the first time the French made use of motorized units on a large scale in Morocco. The following lessons were noted:

(a) It was necessary to form tactical teams constituted with a view to a particular mission.

(b) Only mission type of field orders were possible with these highly mobile units. These presupposed carefully trained, energetic subordinates.

(c) The airplane was the vehicle used to transport commanders between widely separated command posts.

(d) The aviation was attached to the ground forces, a proper procedure in this case.

The following statistics are of interest:

The troops were supplied without a railroad at a distance of about 300 miles from their base. The quartermaster never failed to supply refrigerated meat. Supplies transported over this line of communication amounted to 1,750,000 metric tons and 600,000 liters of gasoline. The Signal Corps laid and maintained about 150 miles of wire. There were 40 stations in the wireless net. Some transmitted up to 20,000 words a day. The motor vehicles of the combat units covered about 1,500 miles in two weeks, much of the distance being cross-country. Only 2% of the vehicles were evacuated for major repairs. Vehicle maintenance was done principally at night.

(2) L'ÉCONOMIE ALLEMANDE DANS LES RAPPORTS AVEC LA DÉFENSE NATIONALE PENDANT LA GUERRE DE 1914-1918. [German economic organization in relation to national defense.] Major Lelarge D'Ervau

As in the case of the Allies, the economic preparations of Germany were insufficient prior to the World War. Although Germany was highly developed industrially, she was dependent on importations of raw materials. The domestic food supply was not seriously deficient in time of peace but became so upon the withdrawal of laborers by mobilization. The financial organization of the nation was sound.

As the war progressed the food situation became increasingly acute. It was met by the following measures:

(a) The population was rigidly rationed and the rations were progressively reduced as time went on.

(b) The live stock reserve of the country was consumed to furnish meat.

(c) Limited imports of food were obtained from adjacent neutrals.

(d) Nitrate fertilizers were obtained by improved methods in the manufacture of nitrogen.

(e) Field labor was carefully organized.

In spite of all measures taken, the food problem was never solved and contributed heavily to Germany's defeat.

The industrial problem was essentially one of raw materials as the factories were more than sufficient to turn out finished products. The following were notable shortages in raw materials:

Crude oil and its products. The absence of heavy greases was damaging to wheeled transport.

Gasoline. Benzol provided a fair substitute.

Rubber. Salvaged rubber was renovated and a limited amount of synthetic rubber was produced. The shortage of gasoline and oil prevented Germany from developing automobile transport in the War.

Leather. Substitutes made of wood fibre, paper, etc., were used wherever leather was not indispensable.

Cotton. Wood cellulose was substituted for nitrocellulose in the making of powder.

Animal and vegetable fats. A limited amount was imported from Holland and Scandinavia. A process of making glycerine from sugar was developed.

Coal. While there was plenty in Germany, the labor shortage and exportations to Allies caused a serious shortage in 1916.

Metals. Only iron, zinc, lead, and magnesium were available in sufficient quantities. By salvaging old metals, importations, and by substituting for metals, the shortage was met successfully.

Nitrogen. The output of the nitrogen fixation plants was increased two and one-half times. A new process for making nitric acid was developed. Gas was substituted for high explosive as a shell filler.

In conclusion, it is seen that Germany did not lose the war from a lack of arms and munitions, although the shortage of food was an important factor. A future study will consider the German economic situation since the war.

(3) EMPLOI MILITAIRE DE L'AVION LÉGER. [The military use for the light, civilian airplane.] Major Eon

In a modern war of mechanized and motorized units the automobile is too slow for the transport of commanders from one critical point of the battlefield to another. The automobile excursions of von Hentsch and von Moltke across the rear of a number of marching armies will not be repeated. Only the airplane is fast enough to permit the commander to intervene opportunely in the battle.

The command airplane should not be obtained by detachments of valuable military airplanes which are unnecessarily fast and heavy. The light commercial airplane, available in large numbers, is well adapted to command and contact missions. These missions will be performed at low altitudes over friendly troops and for short lengths of time. Pilots can be trained by inviting civilian owners to participate in peace-time maneuvers.

By Major C.R. Moore, Corps of Engineers

May 1935

(4) LES ARMÉES FRANCAISES DANS LES OPÉRATIONS OFFENSIVES DE 1918. [The French armies in the offensive operations of 1918.] (I) General Fournier

The Allied offensive on the Western Front began in the middle of July 1918. From its beginning on a limited front, it was quickly and progressively extended. Continued success ended the war within four months.

How were the French armies, while still engaged in defensive operations, able to put forth the necessary effort for an offensive? An explanation is offered in the system developed for rotating reserves. The Germans had two types of divisions, some well equipped, fully seasoned divisions, which were kept up to strength, and others which were so badly depleted that they could only be used to hold quiet sectors. The French commander adopted the expedient of relieving divisions from the front line upon a somewhat flexible time schedule, even though they were not completely exhausted. The practice had the effect of improving morale, and enabling the divisions to be reconstituted much more quickly.

The disadvantages of this procedure were that the minor crises caused by the more frequent reliefs were increased, and that exploitation of success was made more difficult.

The author follows more or less in detail the plans of Marshal Foch for wresting the initiative from the Germans, which culminated in the counteroffensive of Chateau Thierry—Soissons launched on 18 July 1918.

Charts are included to show the schedule followed in rotating units in reserve. The author adds that it was not the system of rotation alone that made available to the French armies the necessary forces for these operations. The participation of British, Italian, and particularly of American divisions also played an important part in enabling the French armies to sustain their offensive operations.

(5) TROIS DÉBARQUEMENTS EN PRÉSENCE DE L'ENNEMI. [Three landings on hostile shores in the presence of the enemy.] (I) Major de Périer

This series of articles is to include a description of three landings on hostile shores during the past eighty years, selected from the numerous studies on this subject by the French General Staff. The operations chosen are:

(a) The French and British landing at Old Fort (Crimea), 14-18 September 1854.

(b) The British landing in Suvla Bay (Dardanelles) 7 August 1915.

(c) The Spanish landing of Alhucemas Bay, 8 September 1925.

Although the initial situation in these three cases was very different, they have many characteristics in common.

In each case the attacker had a strong superiority of forces at the point of attack—an indispensable element in the success of an operation of this type. He had strong means, prepared with care, and used accordng to plans. He chose his time to strike, succeeded in surprising the

defender, and reached the shore without losses. The delays in unloading equipment, as well as the slowness of the commanders to adapt themselves to the new situation on land, permitted the defender to grasp the situation and assemble his forces for resistance. There was a general hesitation on the part of the attacking forces to separate themselves by any distance from the fleet which served as a base for supplies, and as a line of communications to the rear.

Both the preparation and conduct of these operations show the necessity for an energetic and skillful commander, who works in close cooperation with the commander of the naval forces if the naval forces are not directly under his command.

The object of these studies is to present an historical account of these landings on a hostile shore, with a few comments on the manner in which each was conducted. No general conclusions are given, and no prophecies of future methods are offered.

(6) LA FLANDRE FRANCAISE. ESSAI DE GÉOGRAPHIE MILITAIRE. [French Flanders—Essay on military geography.] Captain Thoumin

A complete study of the effect of this area on military operations.

June 1935

(7) LES ARMÉES FRANCAISES DANS LES OPÉRATIONS OFFENSIVES DE 1918. [The French armies in the offensive operations of 1918.] (II) General Fournier

This article is continued from the May issue and covers the operations of the French armies on the Western Front up to the attacks of 26-28 September 1918.

(8) TROIS DÉBARQUEMENTS EN PRÉSENCE DE L'ENNEMI. [Three landings on hostile shores in the presence of the enemy.] (II) Major de Périer

Continued from the May issue, this article describes the British landing in Suvla Bay (Dardanelles), 7 August 1915. The preparations for this attack were admirably conducted. The troops, however, were young and inexperienced. The initial landing was successful, but after reaching shore, disorder and inaction prevailed, giving the enemy the time necessary to oppose the advance from the shore.

A careful preparation of material means is an essential element to success of an opposed landing, but is not sufficient to overcome a lack of proper leadership after the landing is made.

REVUE MILITAIRE SUISSE (Switzerland)

By Major F. During, Infantry

April 1935

(1) HISTOIRE MILITAIRE DE LA GRÈCE (1890-1933). [The military history of Greece.] General Negroponte

In 1897 Greece became involved in war with Turkey. She had no allies, no strategic plan, she was unprepared and had no competent commanders. The war was over in a few weeks. There was only one battle worthy of the name, that of Domokos, where the Greeks missed their chance of a victory. On the other hand, the Turks were unaccountably slow, especially after the capture of Pharsala. The Greeks did not pay heavily for their defeat, but their military prestige abroad fell and their morale was lowered.

In 1912 the three Balkan States formed a league against Turkey, in spite of the efforts of the Great Powers to prevent the war. After a campaign lasting 40 days, Turkey was defeated. If it had not been for bad staff work in the Greek Army, the Turkish Army might have been destroyed during its retirement on Salonica.

During the summer of 1913 Bulgaria, without a declaration of war, attacked her former allies, the Serbs and the Greeks. The campaign lasted a month, and ended in the complete defeat of the Bulgarian Army. King Constantine led the Greek Army with skill, but in this campaign, too, the Greeks made serious blunders.

The attitude of Greece during the World War is well known. At the beginning of the war, nearly all Greeks favored the Entente. When the question arose of taking part in the Dardanelles enterprise, two separate parties were formed. King Constantine and the Gounaris cabinet favored a continuation of neutrality; the Venizelist party was for immediate support of the Entente. Venizelos was still in power when arrangements were made for landing British and French troops at Salonica in October 1915, but he fell soon afterwards.

Both in Great Britain and France the Balkan front was regarded as of secondary importance, and insufficient troops were sent to Salonica to make the expedition a success. General Sarrail, the commander-in-chief of the allied forces, was sent there because he was not wanted in France. The writer considers that Sarrail was to blame for having caused a prolongation of the war. Instead of attempting to unite the whole Greek nation, he played off one party against the other. It was not until General Franchet d'Espérey took over the supreme command that real progress was made.

In 1916-1917 a provisional government was set up at Salonica, which declared war on the Central Powers, and Greece had two governments, the royal government at Athens remaining neutral. After the final defeat of Bulgaria in 1918, the World War came to an end almost everywhere, but Greece became involved in another war with Turkey in Asia Minor. This war has been classed as an act of folly, but the disasters that befell the Greek Army were due, not only to the half-hearted way in which the war was carried on, but to lack of support on the part of the Entente.

(2) EXERCICES ET MANOEUVRES. [Exercises and maneuvers.] Colonel Léderrey

(3) PORTRAITS DE GRANDS CHEFS: FOCH, JOFFRE. [Portraits of two great leaders: Foch and Joffre.] Lieutenant Magnat

May 1935

(4) L'AVENIR DE L'AÉRO-CHIMIE. [The future of aero-chemical warfare.] Lieut. Colonel Mayer

The author discusses the book "La doctrine de guerre du général Douhet," by Colonel Vauthier, in which the latter explains the well known views of General Douhet on the war of the future.

General Douhet's doctrine is that a future war will be decided entirely in the air, and that armies and navies will only play secondary parts. The truth or fallacy of this doctrine cannot be proved from the events of the World War. Conditions have changed greatly since then. General Douhet explains that his doctrine holds good for the present day only. Circumstances may change, and an effectual means of protection against aero-chemical warfare may be discovered.

War is brutal, and it is of no use attempting to limit it to civilized methods. No convention made in peace time for such a purpose will be respected when a country is fighting for its existence. If, from motives of humanity, the initiative of using poison gas or other abominations is left to the enemy, a nation must be ready to use effective reprisals.

The object of aero-chemical warfare will be to terrorize the population, civil as well as military, by attacking the interior of the country, as well as the front.

The first object in aerial warfare will be to obtain the command of the air. Opinions differ as to the methods by which this should be done. The weaker force will not seek an encounter battle, but will avoid it, and it cannot be compelled to fight. It will prefer to concentrate its attention upon ground targets, such as air bases and important munition works.

General Douhet's main principle was to attack with all available strength; there was to be no economy of aerial force, especially at the beginning of hostilities. Signor Mussolini has modified these views to some extent; he admits the possibility of an aerial duel, and intends to provide a powerful aerial artillery. Were Douhet still alive—he died in 1930—he would probably have protested against this idea, as being analogous to General Moltke's interference with, and spoiling of, the Schlieffen

plan. Only the future can show how far Douhet's bold conception has proved to be right.

(5) LE COMBAT DE LOCALITÉS. [Village combats.] (I) Captain Piguet

In this first article Captain Piguet describes three village combats, to be followed, in the next number, by the conclusions drawn from the fighting.

At Bazeilles, on 1 September 1870, the Marine Division (XII Corps) of MacMahon's army made a gallant defense against a corps and a half of Germans. Owing to the fog that prevailed, the German artillery was unable to support the attack. It was not until the Saxon XII Corps outflanked the French that the issue of the fight was decided.

On 21 August 1914, portions of the German Second Army attacked the French position at Arsimont on the Sambre. They did not attempt a frontal attack, but made a successful flank attack from the west. Counterattacks were made, respectively, by one battalion of the 70th Regiment, the whole of the 71st Regiment, and the whole of the 19th Division. Eventually the French retired.

The third battle described is the attack on Dixmude in October 1914. A brigade of Belgian marines, retiring from Antwerp, had been ordered to retire on Dixmude and hold the latter for four days against the advancing German Fourth Army. They actually held out for 26 days, until, finally overwhelmed by superior numbers, they were compelled to fall back to a prepared position west of the Yser. The Germans had no alternative to a frontal attack, and their losses were heavy.

June 1935

(6) EVOCATIONS! LES SOUVENIRS DE COMMANDEMENT DU GÉNÉRAL DE LANGLE DE CARY. [Memoirs of General Langle de Cary.] General Clément-Grandcourt

(7) L'ORGANISATION DES BATTERIES ET DES ÉTATS-MAJORS DE L'ARTILLERIE DE CAMPAGNE. [Organization of field artillery.] (I) Lieut.Colonel de Montmollin

In this article Lieutenant Colonel de Montmollin traces the changes that have taken place in the employment of field artillery since 1914, and compares its organization in the Swiss Army with that in the French, German and Italian armies.

(8) LE COMBAT DE LOCALITÉS. [Village combat.] (II) Captain Piguet

In his previous article Captain Piguet described the attack and defense of three localities: Bazeilles, Arsimont and Dixmude. Here he draws some general conclusions.

Villages offer good concealment from aeroplanes. The line of defense should either be well outside or well inside a village; the outer edge invariably draws the enemy's fire. Powerful flanking fire should be provided outside; and there should be a local and a general reserve.

A village draws on an attacker like a magnet. A frontal attack should never be made. If a village is strongly held, a frontal attack will involve heavy losses; if weakly held, the village will be captured more easily by an enveloping movement. Tanks are useful for opening the way for the infantry. Gas should not be used if it is intended to occupy the village soon afterwards.

Of all phases of modern warfare, village fighting is, perhaps, the most difficult to practice in peace time, but it is a form of fighting that would probably have to be resorted to if Switzerland were ever invaded.

RIVISTA DI ARTIGLIERIA E GENIO (Italy)

By Major F. During, Infantry

March 1935

(1) IL PROBLEMA DELLE MUNIZIONI NELLA GUERRA MONDIALE E LE SUE DIFFICOLTA IN UNA GUERRA FUTURA. [The problem of munitions in the World War and in a future war.] General Bollati

The problem of munitions affected the progress of the World War throughout the greater part of its course. With the commencement of

position warfare on the Western Front it became a serious matter. Russia began the war well equipped with munitions, but was extravagant in their use, and her arrangements for keeping up a supply were inadequate. In the struggle between Austria and Serbia, both sides suffered from shortage of munitions, and only the timely arrival of a train load of French ammunition via Salonika saved Serbia from collapsing a year sooner than she actually did.

The author takes us through each year of the war on the various fronts: Gallipoli in 1915, and Mesopotamia in 1916 failed largely through lack of munitions. The expenditure of ammunition on the Austro-Italian front is examined in considerable detail.

With regard to the future, if another war were to break out, the numbers engaged at the start are not likely to be less than those employed in August 1914. But calculations made in peace time should be based on the state of affairs that prevailed in November 1918, rather than on that of August 1914. Italy is, however, far better prepared than she was in 1915. Her resources have been developed, her roads and railways have been improved, she is well provided with mechanical transport, and her air force is very efficient.

(2) LE INONDAZIONI NEL CAMPO TATTICO. [The inundation of the battle field.] Captain Giampietro

Inundations have often been made use of in warfare, as obstacles to the advance of an enemy. A few instances occurred during the World War. After the Caporetto disaster, Venice was isolated by cutting the dykes. The Belgians successfully held up the German advance by flooding the district around the Yser. At Tannenberg, Hindenburg was able to take advantage of swamps, without having to resort to constructional work.

In dealing with artificial inundations, the usual case will be that of a water course running parallel to and in front of the line to be defended. A dam built across the stream will cause the water to rise until a lake is formed, which will delay the enemy's advance, if not hold it up altogether. The French regulations class inundations as deep if they exceed 6 feet in depth, and as shallow, if they are not more than 18 inches deep.

The site of a dam requires careful selection. If a bridge is handy, its piers will afford support to the fascines or brushwood mattresses used in the construction of the dam. One or more overflow channels must, of course, be provided.

(3) IL CALCOLO PRATICO DELLA PENETRAZIONE DEI PROIETTI E DEGLI EFFETTI DI SCOPPIO. [Methods of calculating the penetration of the projectile and the effect of the burst.] Captains Cavicchioli and Ravelli

(4) CONSIDERAZIONI SUL RIPRISTINO DEI PONTI METALLICI PER FERROVIA. [Repairs of metal railroad bridges.] Captain Paoli

(5) L'ARTIGLIERIA DI ADUA. [The artillery at Adua.] Lieut.Colonel Ravenni

The author gives an account of the gallant conduct of the Italian artillery in the disastrous battle of Adua against the Abyssinians of 1 March 1896.

General Baratieri, believing that the Shoan army was about to disperse, made his dispositions for an attack. He did not consider it likely that the enemy would be in occupation of the hills northeast of Adua; the artillery consequently marched near the head of each column during the fatal night march.

The Albertone brigade of native troops, which was leading, was attacked at daybreak by overwhelming numbers, and the gunners (two Italian, one native battery) were practically annihilated after firing away all their ammunition.

The Arimondi column, ordered up to support the Albertone brigade, was attacked furiously in front and in flank. Its one battery, a mountain battery, came into action early, but all its mules were killed and, after a gallant effort to carry away the guns by hand, the guns had to be abandoned. Two quick-firing batteries, sent up in support by the reserve brigade, were almost wiped out.

The three batteries of the Dabormida brigade were engaged all day and, finally, helped to cover the retirement of the column.

April-May 1935

(6) L'ARTIGLIERIA IN GUERRA DI MOVIMENTO. [Employment of artillery in mobile warfare.] General de Pignier

General de Pignier, Inspector of Artillery, describes at some length the employment of artillery in mobile warfare, with special reference to the rules approved by the new official regulations for the employment of higher units. The greater part of the article is devoted to artillery in attack, as it is in the attack that its employment differs most from that in stabilized warfare.

(7) I BOMBARDIERI NELLA GUERRA DEL 1915-1918. [Bombardment in the World War, 1915-1918.] General Maltese

The author describes the introduction of trench mortars when the belligerents settled down to stabilized warfare on the Western Front. It was not long before these weapons were employed on the Italian Front.

One of the first experimental Italian models was the "Maggiora" mortar, which was fired by the explosion of a mixture of air and acetylene gas—a unique type of its kind. In 1915 the French brought out the Dumézil-Batignolle model, and supplied a few to the Italian Army. Some of the subsequent Italian models were based on this pattern.

In November 1915, a trench-mortar school was started at Susegana on the Piave. The author describes the training at this school and the different types of mortar used; we are told how the different groups were sent out to join the units at the front after completing their course of training. The Trentino offensive in July 1916, necessitated a speeding up of the course. Hitherto gunners only had been trained, but now it was found necessary to take men from the infantry and cavalry.

In 1917 the training was intensified, and the demand increased for the larger types of trench mortars, especially for the long 240-mm. pattern. A 400-mm. mortar was experimented with. The general retirement from the Julian front at the end of October 1917, necessitated the immediate transfer of the school to the south of the Po, where training was again in full swing after an interval of a month.

In 1918 the trench-mortar corps was completely reorganized and did some very valuable work in the front line together with the infantry, contributing largely to the final victory.

(8) IL CONTRIBUTO DELL'ARMA DEL GENIO ALLE OPERAZIONI DI FORZAMENTO DI UNA GRANDE LINEA FLUVIALE. [The work of engineers at river crossings.] Major Cappuccini

(9) LE NOSTRE ATTUALI COGNIZIONI SUL LOGORAMENTO DELLE ARTIGLIERE. [The wear and tear of artillery pieces.] Lieutenant Verduzio

(10) LA RIGENERAZIONE DELL'ARIA NEI RICOVERI ANTIGAS. [Regenerating air in gas proof shelters.] Captain Giardino

ROYAL AIR FORCE QUARTERLY (Great Britain)

October 1935

(1) THE PRINCIPLES OF WAR AND THE R.A.F.—THE OFFENSIVE
(2) OBSERVATION. By "Solaire"
(3) ERITREA. Flight-Lieutenant Greenlaw
(4) AFRICA AND BACK IN A MORNING. Ferrers
(5) MESOPOTAMIAN MEANDERINGS
(6) THIS "BLIND FLYING" BUSINESS. By Q.E.D.

ROYAL ENGINEERS JOURNAL (Great Britain)

September 1935

(1) CROSSING THE NILE. Lieut.-Colonel Phipps
(2) A SPECIALIST LOOKS AT WAR. Brigadier MacLeod
(3) A.A. DEVELOPMENT IN THE ROYAL ENGINEERS. Captain Boyd
(4) THE RECONSTRUCTION OF AYUN BRIDGE. Lieutenant Napier

(5) MORE SKEW GUNS AND MORE SURVEY. By O's R. and B.
(6) MODERN BRIDGING EQUIPMENT—WHAT OF THE TANKS? Captain Daldy
(7) SIMPLICITY AND FLEXIBILITY FOR OUR SERVICE PONTOON EQUIPMENT. By J.A.C.
(8) PORTUGUESE EAST AFRICA, 1918. Lieut.-Colonel Britten

ROYAL TANK CORPS JOURNAL (Great Britain)

August 1935

(1) THE SUEZ CANAL. Captain Wilcox
(2) CAMBRAI. FROM AN INFANTRYMAN'S POINT OF VIEW. McCarthy

October 1935

(3) ARMY TANKS

SANCT CHRISTOPHORUS (Germany)

By Major G.J. Braun, Infantry

April 1935

(1) DAS NEUESTE ÜBER HEERESMOTORISIERUNG IN FREMDEN HEEREN· [Latest data relative motorization of foreign armies.] (I)

Swedish tank, "Landsverck 10."—The "Krasnaja Swjesda," Vol. No. 50 of 1 March 1935, describes the experimental continuation started on reconnaissance cars up to the medium tanks in Sweden. The medium caterpillar traction tank is described as having the following characteristics: weight, 10.5 tons; length, 16.9 feet; width, 7 feet; height, 7.2 feet; 200 horsepower with a maximum speed of 24.8 miles per hour. The armament consists of 3.7-cm. gun and 2 machine guns. One machine gun is built into the front wall whereas the other machine gun and 3.7 cannon are arranged side by side in the revolving turret. The tank carries 150 shells and 300 rounds of machine gun ammunition. It has a crew of 4 men and its armament consists of 14-mm. plate, its climbing ability is 40°, it can cross 5.85 foot trenches and can function in 3.9 feet of water and can carry 227 gallons fuel, giving it a cruising radius of 86.8 miles. The running gear consists of 4 rollers arranged in pairs on either side set in geared roller boxes.

The new French reconnaissance car.—The "Krasnaja Swjesda" describes a new French reconnaissance car designated as "A.M.R." type. The vehicle possesses the following characteristics: it is operated by a crew of 2 men and carries 2 machine guns in the revolving turret, carries 14-mm. armor and has a speed on roads of 23 miles per hour, and 18.5 miles per hour cross country. It is driven by an 80 horsepower motor and can cross trenches 5.5 feet wide, climb 40° grades and carry on in 2 feet of water. It weighs 6 tons and is 11 feet long, 5.36 feet wide, and 5 feet high. The motor is in front and entrance to vehicle in rear.

Review of tanks used in foreign countries.—The present strength of tanks in foreign armies is as follows:

Belgium—50 tanks (2 companies)
Czechoslovakia—about 100 tanks (3 companies)
Esthonia—20 tanks (1 light company and 1 platoon heavy)
Finland—16 tanks (1 company)
France—4,300 tanks (75½ companies)
Great Britain—about 600 tanks (16 companies)
Italy—about 200 tanks (14 companies 4 squadrons light tanks)
Latvia—about 15 tanks (1 company)
Lithuania—30 tanks (1 company)
Poland—600 tanks (24 companies)
Rumania—90 tanks (1 regiment)
Russia—3,000 tanks (5 regiments, 12 independent battalions, 12 independent companies)
Spain—about 120 tanks (8 companies)

Sweden—about 20 tanks (2 companies)
Turkey—150 to 200 tanks
United States—about 1,000 tanks (18 companies; figures include only regular army)
Yugoslavia—about 120 tanks (2 companies)

Objective of British motorization.—The "Army, Navy & Air Force Gazette" quotes the objectives of the British War Office relative to motorization as follows:

"The purpose of motorization of the army is to afford the greatest tactical mobility to the supply service. Keeping this in mind experiments were made with a mobile division as replacement for a cavalry division. Infantry divisions were loaded on trucks and the combat trains motorized to assure the maximum mobility for the infantry. This was carried out to include the division cavalry and the engineers. It is intended that the infantry field and combat trains for 2 divisions be motorized by the spring of 1936, and after that the division artillery.

"At present the organization of the infantry division is only altered by the change of the light artillery detachment as a unit of the division to the motorized army detachment. Other changes in organization may be made as the result of the experiments being conducted with the 6th Infantry Brigade.

"The mobile division probably will constitute a tank brigade and a motorized cavalry brigade taken from a horse regiment and light tanks as well as 3 cavalry regiments loaded on trucks.

"Not including the armored regiment (mechanized regiment), the division will possess the required artillery, engineers and supply trains. Further experiments with motorized cavalry units will be conducted this year in the 2d Cavalry Brigade.

"Staff squadrons with staff platoons (including communication personnel), administration, reconnaissance and ordnance.

"Three squadrons of 3 platoons each, with 31 machine gun squads per squadron.

"One truck is provided for each squad; the reconnaissance platoon is equipped with light cars carrying two men each. The trucks are equipped with armor protection for the motor and driver."

Motorization in Russia.—According to Russian figures they possess 3,000 tanks. Motorization has made great strides in Russia; for example, about a third of their corps and about half the antiaircraft artillery are motorized; similarly all the heavy corps artillery and army reserve artillery are motorized. In addition to this 3 rifle divisions and 7 border guard divisions are completely motorized. The engineers and communications units are only partially motorized. The rifle divisions have motorized reconnaissance units.

(2) DIE MOTORISIERUNG DES JAPANISCHEN HEERES. [The motorization of the Japanese Army.] (See abstract, page 95)

(3) KAMPFWAGEN BEIM GEGENSTOSZ IN DER VERTEIDIGUNG. [Use of tanks in the counterattack in the defense.] (From Russian sources)

In addition to the great number of Russian publications relative to the use of the tank in assault there recently appeared the employment of same in the defense. This is explicitly given by problems and methods of employment in pamphlet No. 3 "Mechanisa ija i motorisa zija RKKA," by Petruschewski.

The author states that a tank battalion is customarily attached to the division assigned to the defense of a sector and used in the "assault group." Russian military literature also refers to automobiles utilized as mobile armored support when tanks are used in the defense. The tanks are assigned to vital strong points in the defense system. Each group of from 1 to 3 tanks are assigned a narrow field activity and then camouflaged and held in readiness to move out into previously prepared positions when the attack begins and engage the hostile tanks by fire. The marksmanship of a stationary tank is far greater than that of a moving tank. According to Petruschewski, the author, and confirmed by other sources, the Russian Army favors the employment of tanks as armored assault groups.

To whom will they be attached? This constitutes the most important question relative to the method of employment. Will the tank battalion be attached to and subject to orders of the commander of the assault group, that is, the regimental commander of the 2d echelon, or should it be completely under the control of the division commander? Both have their pros and cons.

The following advantages would exist if the tank battalion were attached to the commander of the assault group: it would (a) considerably reinforce the assault group; (b) make the assault group independent; (c) simplify the cooperation of the assault group infantry and the tank battalion. It will be more convenient to exchange opinions relative to the general advance.

This method of attachment also has its drawbacks. The division commander would be prematurely permitting this important weapon to slip from his control. In the event of some unforeseen change in the combat situation it might become necessary for the division commander to recall the tank battalion and reassign to it a new mission at the inopportune time after the infantry assault group had prepared an action in which it had relied on the cooperation of the tank battalion. The author also calls attention to an example referred to in the Russian Field Service Regulations relative to the employment of assault tanks even in front of their own defense line. This type of assault has as its purpose the surprising and frightening the enemy when he approaches the defense position by its noise and effect and thereby creating confusion in his ranks. The immediate attachment of the tanks to the infantry assault group, that is under the command of the regimental commander of the 2d echelon, would considerably curtail this method of employment. Whenever the tank battalion is wholly under the division commander's control he then possesses a powerful maneuverable weapon throughout the entire period of the combat which he can employ of his own volition, either in front of the front lines or in rear of the defensive position. On the other hand, the mutual combat activity with the 2d echelon is made considerably more difficult.

The author believes that after weighing the pros and cons, that for all general purposes it is best that the tank battalion remain under the division commander's control. Since in most situations the tank battalion eventually is employed in conjunction with the infantry assault group, the author recommends the following preparatory precautions to facilitate the harmonious cooperation of the infantry and tank:

(a) The points of departure for the tanks in the sector of the division assault group should, if possible, be close to the edge of the position of readiness of the assault group.

(b) The commander of the tank battalion should either have his command post with or in the vicinity of the regimental commander and maintain a direct communication with the division commander and regimental commander.

(c) The commander of the tank battalion must absolutely participate in the 2d echelon regimental commander's reconnaissance in order to note all the possibilities of counterattacks by the assault group and become familiar with the regimental commander's intentions of employment of the assault group.

(d) It is also imperative that reconnaissances be conducted by units of the tank battalion down to and including the platoon leaders in close cooperation with the infantry. To make these reconnaissances worth while, the intentions of the infantry assault group commander must be known to the tank battalion commander. All possible avenues of approach by the tank battalion must be discussed. In this respect it is important to note: the direction of the intended attack, designation of sectors for the development of the attack, assembly points, positions that afford the best field of fire, and special attention should be given to such terrain from which hostile tank attack can be expected.

(e) As soon as the reconnaissance is completed the staff of the tank battalion will prepare the tank defense plan in mutual cooperation with

the staff of all units (division staff). The arrangement of the tank defense should compel the enemy to move his tanks along such direction as is desired by the defense so that the defender can then surprise and overcome him. It is desirable that every company commander of the tank battalion possess a copy of this tank defense plan.

The next most important problem is the cooperation of the tank battalion with the artillery for situations in which the tanks conduct a sortie in front of their own defense lines and also in the event of a hostile penetration of the defense lines. The scheme of fire support for the attacking tanks must be prepared in the presence of members of the tank battalion staff and must be included in the artillery firing plan. The close cooperation with the artillery is important because the tank battalion must take into consideration the routine fire activity and missions of the artillery.

The decision as to where a tank attack can best be employed, that is, in front of their own front lines or somewhere within the defense sector will depend on the situation. The conformation of the terrain and the information of the enemy will play an important role in this decision.

The availability of well covered terrain which would make it possible to move the tank battalion close to the defense line, offers the division commander the possibility from this position to engage the enemy by surprise in the outpost area as he is preparing for the attack. This is an opportunity for success which a commander does not wish to miss.

In such cases it is worth while to reconnoiter and definitely decide on the place of departure for the attack as well as that of the support areas in the sector.

The author gives the following procedure for the combined attack with the tank battalion and infantry assault group: The tank commander receives from the regimental commander of the 2d echelon the information that the division has ordered the assault group to counterattack. He immediately alerts his battalion so that upon signal it will automatically move out. The signal for the tank battalion to attack must be given by the division, for example, by light rocket. Only when the enemy tanks suddenly appear in front of the support position area of the tank battalion would the tank battalion commander be justified to attack without waiting for the signal.

The attack objectives should be first the hostile tanks, then their artillery and finally their machine guns and infantry itself. After the attack the tanks must assemble in a new previously announced reserve position.

(4) KRAFTFAHRER VOR VERDUN 1916. 5. ARMEE III. A.K. [Motor vehicles at Verdun 1916. Fifth Army, III Army Corps.]

This article refers to the personal experience of the commander of a motor ambulance company. The setting is about the end of February 1916 at the time of the spring offensive against Verdun when the German III Army Corps experienced an unusual difficult situation relative to evacuation of its wounded. Due to the severity of the combat the number of wounded was great. The allied artillery fire so destroyed the roads that even horse-drawn ambulances could not negotiate. The Germans resorted to the construction of a narrow gauge railroad but this also was disrupted by shell fire. The situation became extremely acute due to the progressive accumulation of wounded in the vicinity of the church of Ornes where the main dressing station was located.

The author's reconnaissance disclosed that the roads to the rear were so badly torn up by shell craters and mud as to render them impassible for either horse-drawn or motor vehicles, especially with wounded. A road parallel to the front and visible by day to the enemy was chosen as a last resort for evacuation. Consent of neighboring corps had to be obtained to evacuate through their sector, columns had to be rerouted during the night, roads cleared of ammunition trucks, and other arrangements had to be made for this enterprise. After 36 hours of superhuman effort the wounded were evacuated by using animal transportation part way, and trucks, omnibusses and ambulances the rest of the way. This

relieved a critical situation at the main dressing station of the III Corps by evacuating 300 or more wounded and making same available for the expected influx of wounded to come that day due to the scheduled offensive.

The article is interesting and is a reminder of the acute problems that confront a commander in combat.

May 1935

(5) KAMPFWAGEN-UEBUNGEN IM WINTER. ZUSAMMENWIRKEN VON KAMPFWAGEN MIT SCHÜTZEN AUF SCHNEESCHUHEN. [Winter tank exercises. Combined exercises of tanks with riflemen on skis.]

Abstract of this article will appear in the next number of this publication.

(6) KAMPFWAGEN-ANGRIFF BEI NACHT. [Tank attacks at night.] (See abstract, page 84)

June 1935

(7) DAS GEFECHT "KAMPFWAGEN GEGEN KAMPFWAGEN." [The combat of tanks versus tanks.] (III)

Abstract of this article will appear in the next number of this publication.

(8) DAS NEUESTE ÜBER DIE HEERESMOTORISIERUNG IN FREMDEN HEEREN. [Latest data relative motorization of foreign armies.] (II)

Russia.—At the last Russian May-day celebration in Moscow, 2,330 tanks of various types participated in the military review. Similar reviews were held in other large cities. It is an accepted fact that Russia now possesses about 4,000 tanks of various types.

France.—It is a known fact that France is energetically carrying out far-reaching military motorization of its army. Great strides were made this past year. It is unnecessary to state that it has materially enhanced the shock strength of its forces.

According to newspaper reports all army artillery units, as well as the major portion of its antiaircraft artillery, are motorized, and that of the corps artillery is in the process of motorization. With the motorization of 4 division artillery regiments which is also in progress at the present time, France will have 35% of its division artillery motorized.

About 25% of the infantry divisions are equipped to be loaded on trucks which are assigned to the divisions. These divisions are equipped with armored caterpillar track vehicles for supply of ammunition, equipment and rations.

Four of the five cavalry divisions are almost completely motorized so that each division has two horse and one motorized brigade. The motorized brigades contain the armored car squadrons. Motorization is carried on still further. Heavy weapons are motorized and a number of former horse squadrons are now on motorcycles. The artillery of the cavalry division is also being motorized.

Radio units of the signal corps are motorized, whereas the majority of telephone units of the infantry divisions still possess animal transportation. Most all engineer units, except those with the infantry, are motorized.

The artillery is being equipped with 6-wheel trucks which haul pneumatic-tired guns.

Great Britain.—(Motorization of infantry) Attempts to motorize the light mortars and antitank weapons with the well-known Carden-Lloyd caterpillar tractors appear to have been abandoned. Considerable experiments with these units are being conducted by the 1st Division. It is interesting to note that experiments were carried out by the 6th and 7th Infantry Brigades with armored machine gun vehicles to be used in coordination with the infantry in the attack.

Italy.—(Motorization of machine gun companies) The "Krassnaja Swjesda" states that Italy is gradually motorizing her machine gun companies. A portion of these are transported by motorcycle side cars. Newspaper reports state that the Italian infantry will be equipped with fast tanks to conquer that "last 300 yards." Numerous cavalry troops are to be converted into tank companies. These are to be equipped with fast light tanks with a rate of speed of 31 miles per hour.

Japan.—The "Krassnaja Swjesda" states that Japanese heavy artillery will soon be completely motorized and that the medium artillery will be 25% motorized.

SIGNAL CORPS BULLETIN

September-October 1935

(1) WARTIME SELECTION, TRAINING, AND REPLACEMENT OF SIGNAL CORPS PERSONNEL. Major Hinemon

(2) RADIO ENERGY RADIATION AND PROPAGATION. Major Colton

(3) EXPERIMENTATION IN THE TRAINING OF NIGHT FLYING PIGEONS TO MOBILE LOFT. FROM A REPORT OF THE SIGNAL OFFICER, HAWAIIAN DEPARTMENT

November-December 1935

(4) COMMAND. Major General King

(5) A STUDY OF TELEPHONE AND TELEGRAPH EQUIPMENT OF THE ARMY CORPS. Major Miller

(6) TIME. Captain Teague

WEHRTECHNISCHE MONATSHEFTE (Germany)

(Formerly "Wehr und Waffen")

By Major F. During, Infantry

April 1935

(1) WERTUNG DER WAFFE. [Valuation of the weapon.] Admiral Hansen, Retired

(2) NEUZEITLICHE WAFFENENTWICKLUNG UND PROBLEM DER TANKABWEHR. [Modern development of weapons and the problem of antitank defense.] Major Däniker

Starting with the intimate connection between fire and movement, viz., that the object of fire is either to prevent the enemy's movement or to facilitate your own, Major Däniker points out how the modern development of the flat-trajectory weapon has been all in favor of the defense, since the defender can protect himself easier against it, and with his machine guns kept close to the ground, can come quickly into action against an attack, while the attacker's flat-trajectory fire must cease long before his infantry approaches their objective. The machine gun shows thus a deficiency in offensive power, and the attacker has to rely more upon his artillery and trench mortars. The relative power of the defense had gained so much in modern warfare that the tank was invented to overcome the difficulties of the attacker and to restore movement to the battlefield. Major Däniker calls the invention of the tank an "ingenious act of despair." The limitations to the further development of the tank are both obvious and grave, while the possibilities of antitank defense are by no means exhausted. The author genially suggests, for instance, that where antitank weapons are not present in sufficient numbers (and it is not easy to see how the large number claimed as necessary, viz., 16 per battalion, can be provided), a small light weapon, quite incapable of piercing a tank's armor, might still fire at it a smoke-producing substance, which would blind it for sufficient time for an antitank weapon to arrive. Where antitank defense can be organized, tanks, even with their improved speed and cross-country powers, should not be able to do more than get through singly, and not in mass. As for the battle between mechanized armies, this is only possible if both parties agreed to have none other than mechanized troops; it may be ruled out as long as the defensive power of modern weapons is able to forbid the movement of mechanized formations, even if only locally. The mechanized raid will be no more decisive than was the old-time cavalry raid.

Recent war experience with tanks in the Gran Chaco has confirmed that a few tanks can do nothing, as they are quickly put out of action one by one; while in China the Japanese aeroplanes accompanying the tanks proved mostly incapable of discovering the Chinese antitank guns, which, concealed until the last moment, brought the tank attacks to a standstill.

The defeat of the tank is brought about best by a weapon of a defensive nature.

(3) DIE SPRENGUNG DES CIMONE-KOPFES DURCH DIE ÖSTERR.-UNGARISCHEN TRUPPEN. [The blowing up of the summit of Mount Cimone by Austro-Hungarian troops.] Kaldor

The Austro-Hungarian offensive from the Tyrol in May 1916, broke through the Italian position between Mt. Pasubio and Asiago as far as the edge of the Tonezza Plateau, overlooking Arsiero. Here it was held by the Italians gallantly recapturing Mount Cimone, which rises 230 yards above the rest of the plateau and is its farthest point. The Italians thus saved the Venetian plain, and the rear of their Isonzo armies, but it was touch and go. The summit of the mountain was quickly fortified, and defended by over 20 machine guns. The Austrian line settled within 100 yards of the top with its sentries only 30 to 40 yards from the Italian wire. Their position was very uncomfortable, as the plateau was so narrow as to constitute a defile, and the prospect of capturing the summit was negligibly small. Here technique intervened, Lieutenant Makler of the sapper battalion proposing to mine the mountain top. Starting his galleries so close that working was interfered with even by hand grenades, he drove three shafts, spoil being removed at night. The Italians at once got busy counter-mining. Fortunately for the miners' nerves both sides used pneumatic borers, so that as long as the noise of the enemy's boring continued the miners felt safe. The work lasted weeks. At length, when the Austrians were ready to blow, a patrol brought in an Italian prisoner who had on him the date and time of the next battalion relief. Ten tons of ecrasite were built into the mine chambers (while the automatic borers were kept studiously working elsewhere), and fired at 5:45 AM, on 23 September, while the battalion relief was in progress. The whole position was wrecked. An Austrian officer and 100 selected men went forward and occupied the crater. At 8:00 AM the Italians opened barrage fire on the position, and 28-cm. air torpedoes could be watched coming up from the valley. The author, a captain in a mountain battery, noted that the barrage, which had at first been deadly accurate, diminished in efficiency as the sun got higher and the air hotter. The Italian shells then started passing over the position and bursting in the valleys on either side of the narrow spur. An Italian searchlight directed on Mount Cimone all night served the Austrian working parties for putting the crater in a state of defense. The Austrians had two men killed; they took 600 prisoners, whom they had first to release from their blocked dugouts, and calculated that they had killed 900 more. Their successful enterprise against this mountain-top was an appropriate answer to a similar Italian success on the Col di Lana the winter before.

May 1935

(4) DIE ROHSTOFFWIRTSCHAFT IM WELTKRIEG UND IN DER GEGENWART. [Raw material in the World War and now.] Wiedenfeld

(5) SCHUSZWEITEN NEUZEITLICHER GESCHÜTZE. [Ranges of modern guns.] Lieut. General von Botzheim

(6) EIN NEUES BETONIERVERFAHREN IM DIENSTE DER MILITÄRTECHNIK. [A new process for making concrete for military purposes.] Schneiders

June 1935

(7) ARTILLERISTISCHE SCHIESZGRUNDLAGEN. [Basic principles for artillery firing.] Kremmler

(8) TECHNISCH BEDINGTE SCHWIERIGKEITEN BEI DER FÜHRUNG MECHANISIERTER VERBÄNDE. [Difficulties in the leadership of mechanized units.] Major Bertkau, Retired

The author is pointing out the weaknesses and limitations of mechanized formation units in their conduct and warfare, and carries his tale as far as expense of provision, upkeep, "the unceasing river of oil," and replacement. Mechanization has arrived and will remain. The difficulties that beset mechanization, many of them nursery troubles, having once been recognized, the problem is to remove them so as to make of mechani-

zation a capable weapon. As regards the tank, the author still holds to his opinion that the best answer is a well-prepared artillery.

(9) DAS FEUER ALS WAFFE IM KAMPF. [Fire as a weapon.] (I) Dr. Reddemann

WISSEN UND WEHR (Germany)

By Major G.J. Braun, Infantry

May 1935

(1) BEI EINER DEUTSCHEN ANGRIFFSDIVISION WÄHREND DREIER OFFENSIVEN DES JAHRES 1918. [Experiences of a German attack division during three offensives in 1918.] (I) General v.Bergmann

This article describes the actions of the German 113th Infantry Brigade which General v.Bergmann commanded in the March 1918 offensive on the Somme. The division was the flank division of the III Army Corps, German Eighteenth Army, in the Group of Armies under the Crown Prince. In preparation for the offensive it went into a two-week training session to acquaint the officers and men with the features of open warfare since this offensive was intended to end position warfare by a penetration deep enough to get away from the stabilized positions. Rehearsals were conducted on similar terrain, in conjunction with its artillery and attached units to develop teamwork.

The approach march to their assembly areas were conducted at night, daylight bivouacs were made in woods or villages with strict instructions to keep under cover, halts on roads were forbidden. Munition columns filled the roads at night, creating great stores of munitions near the front lines. Routine firing continued at the front so as not to arouse the enemy's suspicions. Enemy fire frequently destroyed dumps, illuminating the sky, and the hostile air force dominated the air. Fear of discovery of plans made the situation tense.

21 March was the day of the attack which was to be preceded by a terrific preparatory bombardment at dawn. Unfortunately a heavy fog occurred on this day eliminating the contemplated observed fire and aircraft support with the result that many wire obstacles and machine gun nests remained intact.

The attack progressed rapidly, penetrating the first three lines, driving the British over the Somme River and Canal. Certain highly organized hostile points such as Holnon Woods were avoided, passed by and then taken from the flanks and rear. Considerable difficulties were experienced due to the fog, such as mixing of units and in one case where a shot from the German artillery fell in the midst of a regimental staff; the scattered staff was not reunited until the next day, causing the regimental commander to conduct the fight of his regiment from a battalion command post. The hard-pressed British counterattacked with tanks at Villecholles. These were destroyed by machine-gun fire. The British rear guard action, using cavalry, delayed the crossing of the Somme and the adjacent marsh land, allowing sufficient time for a British machine-gun defense with telephone intercommunication between guns to be established. This defense delayed the crossing of the Somme and the canal 24 hours, taking heavy toll from the German attackers. The artillery and infantry which had run short of ammunition for immediate assault, having moved faster than supplies could be forwarded, now were replenished. By renewal of the assault the Somme and canal were crossed but with severe losses due to the British defense which had strengthened, having been pushed against their own well supplied area. The 113th Infantry Division was relieved by other units and passed to the reserve.

(2) MACHT UND MÖGLICHKEITEN DES BRITISCHEN UND DES FRANZÖSISCHEN WELTREICHES. [Power and possibilities of the British and French world empires.] Colonel v.Xylander

This article gives the military resumé of the foreign policies of these nations as it effects their armed forces in their dominions, territories and mandates.

(3) DER GROSZFÜRST NIKOLAI NIKOLAJEWITSCH UND SEINE UMGEBUNG. [Grand Duke Nikolai Nikolajewitsch and his associates.] General Noskoff

(4) ARTILLERIE UND MINEN IN DEN DARDANELLEN. [Use of artillery and mines in the Dardanelles.] Captain Ruge, German Navy

June 1935

(5) DIE POLITISCHE BEDEUTUNG DES VÖLKERRECHTS. [The political significance of the rights of nations.]

From a lecture delivered by Victor Bruns, 28 May 1935, at the general meeting of the German Society for Military Politics and Military Education.

(6) BEVÖLKERUNGSENTWICKLUNG UND WEHRKRAFT. [Development of nations and military power.] Dr. Burgdörfer

(7) BEI EINER DEUTSCHEN ANGRIFFSDIVISION WÄHREND DREIER OFFENSIVEN DES JAHRES 1918. [Experiences of a German attack division in three offensives in 1918.] (II) General v.Bergmann

The author describes the conditions immediately after the Somme offensive explaining how the failure of ammunition supplies to the front lines prevented the exploitation of the breakthrough and enabled the hostile artillery to inflict casualties without retaliation and thereby lower the morale of the troops who needed rest.

He describes the blending of replacements with the old soldiers in the division and their preparatory training for the Chemin des Dames offensive. Troops were trained in attacking machine gun nests, crossing wide marshy areas and the rapid crossing of small streams in darkness and the climbing of steep slopes and cliffs.

He explained how the concentration and surprise was made possible by night marches and how the movements forward were protected by the loud croaking of the frogs in the marshes. The French were known to have lightly garrisoned the heights, relying on the natural terrain features such as the steep approach slopes bordered below by wide marshes and the Ailette River and canal affording protection.

The author stated that the concentration was completed at 1:15 AM on 27 May and that the artillery preparation for the attack started at 2:00 AM, followed by the infantry assault at 4:00 AM. The fast tempo of the artillery barrage left the infantry unprotected as it was unable to keep up because its progress through the undergrowth covered marsh had been retarded. Despite this the river and canal were crossed and the heights taken. The surprise was complete.

The author describes the attack in detail and its movements during the remainder of the offensive. (To be concluded)

FOREIGN AFFAIRS

October 1935

(1) GEOGRAPHY, ETHIOPIA'S ALLY. Scaetta
(2) FEUDAL ETHIOPIA AND HER ARMY. Woolbert
(3) INTER-RACIAL IMPLICATIONS: A NEGRO VIEW. DuBois
(4) THE SUEZ CANAL IN TIME OF WAR. Hoskins

FOREIGN POLICY REPORTS

28 August 1935

(1) CURRENCY STABILIZATION AND WORLD RECOVERY. deWilde

11 September 1935

(2) IMPERIALIST RIVALRIES IN ETHIOPIA. Koren

25 September 1935

(3) AUSTRIA ESTABLISHES A FASCIST STATE. Wertheimer

9 October 1935

(4) TWELVE YEARS OF THE TURKISH REPUBLIC. Merrill

23 October 1935

(5) THE END OF NAVAL DISARMAMENT. Popper

6 November 1935

(6) THE LEAGUE AND THE ITALO-ETHIOPIAN CRISIS. Dean

ROUND TABLE (Great Britain)

September 1935

(1) EUROPE, THE LEAGUE AND ABYSSINIA
(2) JAPAN IN CHINA: THE NEW FAR-EASTERN PROBLEM

Section 5

Academic Notes

THE COMMAND AND GENERAL STAFF SCHOOL

REPRINT OF CURRENT SCHOOL MATERIAL, WHICH AFFECTS INSTRUCTIONAL PROCEDURE OR TACTICAL DOCTRINES

Instructional Organization

Commandant
BRIGADIER GENERAL H. J. BREES

Assistant Commandant
COLONEL W. B. BURTT

Secretary
LIEUTENANT COLONEL W. R. NICHOLS

Directors

Second-Year Class	COLONEL T. MILLER
One-Year Class	COLONEL J. A. MCANDREW
Special Class and Extension Course	COLONEL R. TALBOT, Jr.

Chiefs of Sections

I. Offense	LIEUTENANT COLONEL J. E. SLOAN
II. Intelligence and Special Operations	LIEUTENANT COLONEL J. H. HOOD
III. Defense and Security	LIEUTENANT COLONEL W.M. GRIMES
IV. Supply and Administration	LIEUTENANT COLONEL T. LAWRENCE
V. Publications	LIEUTENANT COLONEL E. B. WALKER

CONTENTS

	Page
Employment of Division, Corps, and Army Cavalry	179
Defense-Security	190
Protection of Lines of Communications	198
Compartments of Terrain	210
Organization and Employment of Reconnaissance Detachments	230
Genghis Khan and the Modern Mechanized Force. An Historical Example	235
Combat Orders	Supplement

NOTE.—Inasmuch as decisions and plans of a commander are translated into action by means of orders, the method of preparing and issuing orders is therefore a vital part of military instruction.

The new pamphlet "Combat Orders," which will be issued as a supplement to this number of the *Review of Military Literature*, emphasizes that orders should be concise and suited to the state of training of the troops who must execute them. (*Editor*)

THE EMPLOYMENT OF DIVISION, CORPS, AND ARMY CAVALRY

[25 August 1935]

	Paragraph
Purpose	1
General functions of cavalry	2
Responsibility for the correct employment of cavalry	3
Specific cavalry characteristics	4
Principles governing the employment of cavalry	5
Specific cavalry missions	6
Procedure	7

1. PURPOSE.—The purpose of this text is to state the principles and methods applicable to the employment of such cavalry (horse) as may be a component of infantry divisions, corps, and armies. These principles are the same for units of any size, the difference in their application being that necessitated by the varying conditions of time and space, supply requirements, and control.

2. GENERAL FUNCTIONS OF CAVALRY.—All combat arms perform in varying degree and manner the following general types of missions:

Reconnaissance;
Interference with or obstruction of the enemy's movements, supply, or control;
Deception of the enemy;
Participation in the decisive phase of the battle to assist in gaining the decision.

Every arm has two essential characteristics, mobility and fire power. To a considerable extent these two qualities are mutually opposed in that the increase of the one must usually be made at the expense of the other. Because of the need for different degrees of each, no one arm of the service can perform effectively all of the missions incident to active operations. In all operations of open warfare, and at critical moments during periods of stabilized warfare, one or more of the missions must be performed at a distance from the main force, or maximum advantage of time and space factors must be taken through the rapid movement of a strong combat force. To execute these missions satisfactorily there must be a combat arm, which, while possessing reasonable combat strength, has also a high degree of mobility. The cavalry is organized, armed, and trained for such duties. In mobile warfare the cavalry is always an important element of the command and in many cases exercises a decisive influence on the success of operations.

3. RESPONSIBILITY FOR THE CORRECT EMPLOYMENT OF CAVALRY.—Because of the vital relation which the proper employment of the cavalry bears to the success of the plan of operations or scheme of maneuver of the entire force, the responsibility for such employment rests with the commander of that force. To insure that the cavalry missions will contribute to the success of the scheme of maneuver the commander must have a clear understanding of the general characteristics of cavalry and of the missions which it executes. In each situation he must know the capabilities of his cavalry as determined by such factors as relative strength, physical and moral condition, training, quality of leadership, and others of similar nature. He is responsible that the orders to the cavalry definitely and clearly state the mission of that arm.

4. SPECIFIC CAVALRY CHARACTERISTICS. — *a. Combat power.*—In every situation combat power is relative. Many factors such as morale, training, and physical condition, influence the effectiveness of any arm at any moment, but the basis for general comparison lies in the type of combat employed and the type and number of weapons possessed by the unit. The cavalry is similar to the infantry in that its

basic combat element is the soldier armed with an individual weapon. Like the infantry it can capture or hold ground, and can engage in close personal combat. Its combat is therefore similar to that of infantry and the general measure of its effectiveness is its relative strength in fire power. A more exact comparison can be made from a study of current tables of organization. In addition to its basic mounted units the cavalry has mechanized fighting units, armored cars, scout cars, and combat cars, which on favorable terrain add greatly to the fire power of the cavalry. Such vehicles, although armored, are vulnerable to the fire of antitank weapons. Mounted units are provided with effective antitank weapons.

b. Mobility.—(1) *Mounted units.*—As compared to that of infantry, the mobility of the cavalry is greatly superior in range and rapidity. It is elastic, varying within wide limits. On road marches the cavalry normally covers about twenty-five to thirty miles per day at a rate of five or six miles an hour. With well trained troops in good condition, marches of about fifty miles per day can be maintained for several days. A march of one hundred miles, terminating with troops in condition for combat, can be made in twenty-four hours if the men and animals are in excellent condition, of suitable type, properly trained, and if the march is correctly conducted. Cavalry commands have, when necessary, covered about twelve miles in one hour. For purposes of maneuver or mounted attack on the battlefield, the cavalry can move at rates up to twenty miles an hour across country for short distances. Unfavorable conditions, particularly those of the terrain, weather, condition and training of the men and animals, will reduce these capabilities. The proximity of the enemy, necessitating security measures, movement by bounds, and delays en route also reduce the actual performances of cavalry marches and maneuvers.

(2) *Mechanized units.*—Unlike men and animals the mobility of mechanized units is not definitely fixed by nature within the same narrow limits. The development of fighting vehicles is constantly in a state of progress. Armored and scout cars on wheels are capable of rapid movement on suitable roads within their radius of action. With

roads in poor condition this mobility is greatly reduced. Off roads this mobility is still further reduced. Track laying vehicles are not handicapped to the same extent. The mobility of any mechanized unit must be determined at a given time from the state of development of the vehicles in relation to the conditions of weather and terrain which they encounter. As with the mounted units, hostile activities greatly reduce the average rate of movement. Mechanized units are completely dependent on an adequate supply of fuel. Unlike horses they cease to function as soon as the fuel is exhausted.

(3) The greater tactical mobility of the cavalry when opposed to infantry permits it to concentrate rapidly at a decisive point, to maneuver freely, to strike quickly and successively at widely separated points, to engage on wide fronts, and to withdraw from action quickly and safely. It is effective in combat, such as delaying action, where maximum fire power must be quickly developed but where long continuation of combat is not required.

5. PRINCIPLES GOVERNING THE EMPLOYMENT OF CAVALRY.—*a. Preservation of mobility.*—As far as conditions under his control permit, the commander must preserve the mobility of his cavalry. He accomplishes this by employing the cavalry only on necessary and proper tactical missions, and by insuring an adequate system of supply and replacements. Missions not contributing to the success of the general scheme of maneuver merely waste energy, animals and personnel. Large forces of cavalry should not be expended on missions which can be satisfactorily executed by a small force. Excessive marching should be avoided, situations being correctly anticipated so that the cavalry can be used at the correct time and place without hurried or long marches. Opportunities for rest and recuperation of condition should be sought, one day a week being allowed for complete rest when practicable. In active operations the losses in horseflesh are such that every effort must be made to maintain a constant flow of replacements. The continuous supply of adequate forage and horseshoes is essential, whether such supplies are forwarded from the rear or secured from local sources. The availability of water is an essential consideration in planning any operation. Higher commanders should insure that the cavalry commanders

under their control maintain their units in a high state of discipline and training, and lose no favorable opportunity to improve the condition of their commands.

In stabilized warfare it sometimes becomes necessary or desirable to dismount the cavalry entirely and utilize it as infantry. If possible, such action is to be avoided. Subsequent operations may demand the use of a mobile force. To reconstitute the cavalry will require a much longer time than can be permitted by the requirements of the tactical situation.

b. Utilization of mobility.—(1) In any situation the cavalry must be employed as may be most expedient. However, to secure the greatest effectiveness from this arm it should be sent on missions where its mobility can be utilized. Infantry and cavalry are similar in combat methods. Practically every mission for either arm requires the use of combat in some degree. On the other hand, when the space in which a particular mission is to be performed is limited, or when great rapidity of movement is not required, little mobility need be available. Therefore, when practicable, the cavalry should be employed in those localities where its mobility as well as its fire can or should be used, while infantry should perform similar missions where less mobility is needed or possible. For these reasons the cavalry is usually employed beyond the immediate vicinity of the bulk of the infantry, in areas permitting free and rapid maneuver, in front of an advancing force, behind a retiring one, or on an exposed flank. When such conditions do not exist the cavalry is usually retained as a mobile reserve, available for immediate employment when conditions become more favorable.

(2) Unless the tactical results gained by sacrificing it are essential, the cavalry should not be required to operate at such distance from the main force or in such manner that it is seriously exposed to being cut off and destroyed. This danger applies particularly to small forces of division and corps cavalry when opposed by strong horse or mechanized cavalry.

c. Mass—Economy of force.—As far as lies within the power of the higher commander he should insure that the cavalry be strong enough to overcome or neutralize such hostile opposition as it may encounter in the execution of

its mission. If this mission requires offensive action the cavalry should be afforded a definite numerical superiority. If only defensive action is probable a weaker force may be satisfactory. To obtain and maintain a dominant superiority over hostile cavalry one's own cavalry should be stronger. Rarely does a commander possess sufficient cavalry to provide superiority on all cavalry missions. In order to insure maximum superiority for the principal or decisive mission, others less important must either be neglected, given to infantry, or executed in a restricted manner by a minimum force of cavalry. Particularly in operations which seek the complete defeat and destruction of a hostile force it is essential to employ the mass of the cavalry to prevent the escape of the enemy, forcing him to fight to a decision. Unless this is done, the battle, while classed as a victory, will not produce decisive and permanent results.

If the available cavalry is insufficient for the proper execution of a necessary mission, then it should be reinforced by infantry and artillery. When practicable such infantry should be motorized.

d. Anticipation.—To insure the effective action of the cavalry at the proper time and place the higher commander must anticipate such action and provide for it by means of warning orders, preparatory movements, and by coordination of successive missions.

e. Control.—The cavalry is an agency of the commander of the force to which it pertains and its employment is determined and directed by him. If the employment of the cavalry is such that it must be closely coordinated with the immediate scheme of maneuver of a subordinate unit rather than of the entire force and if that subordinate is able to control the cavalry operations, then the attachment of the cavalry to such subordinate unit is proper. When the missions of the cavalry forces are such that they should be closely coordinated they should be placed under unified command. This is particularly applicable in the organization of a provisional cavalry corps composed of the two divisions organically pertaining to the army.

f. Orders.—(1) In many cases cavalry operations fail because the orders given the cavalry commander are

faulty. It is obvious that he, having less information, being less well acquainted with the general scheme of maneuver, and frequently harassed by his own difficulties, cannot always be expected to have a clear idea of just what is desired of the cavalry by the higher commander. If there are several things which the cavalry might do, but only one which the higher commander wants done, it is apparent that the lack of clarity in orders issued to the cavalry may be disastrous. While it might be expected that a trained leader would be able to estimate definitely what is desired, the fact remains that it is frequently not done. Generalities are dangerous. Orders must be specific. The order to the cavalry should include as many as practicable of the following items: *What* the cavalry is to do, *when, where* and sometimes *why* it is to do it. It is frequently observed that in orders the *why* element is confused with the *what.* This is found in the use of such terms as *cover, protect, screen.* While these expressions have definite meanings as given in the *Staff Officers' Field Manual,* these meanings are general, and give the reason *why* the commander desires the cavalry to perform the particular task given it. For example, consider a mission *to cover the advance.* The decision as to what must be protected and what constitutes such protection is obviously the responsibility of the higher commander rather than the cavalry leader. It is the former's scheme of maneuver. If the responsibility is passed to the cavalry the result may be disastrous. An illustration is the mission frequently seen: *To cover the debouchment of the corps from the eastern exit of Cashtown Pass.* The successful execution of the scheme of maneuver of the corps is dependent on two factors. First, the enemy must be kept beyond artillery range of the exit from the pass. Second, sufficient space must be secured east of the pass to permit the free maneuver of the single column into such other formation as may be desired. Translated into definite terms of time and space the commander estimates that the enemy must be kept east of a particular line until such hour as the debouchment is completed. Because of the intimate relation of this security requirement to the scheme of maneuver it should not be left to the judgment of a subordinate commander who may not have the

corps viewpoint. In this case the mission, broken into its elements, should properly be:

Why: Cover the debouchment of the corps from the Cashtown Pass.

What: Holding the enemy.

Where: East of the line: Round Top—Wolf Hill.

When: Until * * * * *

In this mission the corps commander accepts full responsibility for the requirements of his scheme of maneuver, estimates them and says definitely what the covering force is to do in order to accomplish the requirement. *How* the cavalry is to execute its mission is left to the initiative of the cavalry commander. As far as his freedom of maneuver permits he may employ any of the methods characteristic of the cavalry.

(2) If two or more missions are given the cavalry in the same order they should be assigned a priority in importance, to guide the cavalry commander if the situation makes it impracticable to execute both properly.

(3) The *when* element is not necessarily expressed in terms of dates or hours. It may be made contingent on some event whose occurrence is a necessary part of the conditions underlying the mission. This is frequently true in operations whose rate of progress cannot be previously determined, such as the hour of advance of cavalry exploiting a breakthrough by the infantry of a hostile defensive position. In whatever manner the *when* element is expressed the cavalry commander should be able to know definitely when his own operation is to be initiated or completed, or both.

6. SPECIFIC CAVALRY MISSIONS.—*a. Reconnaissance.*—(1) Cavalry operates day and night, in all kinds of weather and on practically any kind of terrain. It can maintain continuous contact with the hostile forces. Armored or scout car reconnaissance, operating under the control of the cavalry commander, quickly covers a large area, securing positive or negative information of a general nature which serves to direct the bulk of the cavalry in seeking detailed information of definitely located hostile forces. Mounted patrols and detachments supported by the combat strength of the cavalry break through or resist hostile covering

forces and secure more detailed information, including identifications.

(2) The reconnaissance mission follows the requirements of the *Essential Elements of Enemy Information* and the *G-2* Plan and is coordinated with the air service missions. The bulk of the cavalry should be employed against those forces against which one's own force must operate and of which detailed information is desired. The essential factors in the reconnaissance mission are:

What information is to be sought. This relates generally to strength, composition, movements, dispositions, or other items.

Where the information is to be sought. This may be a particular hostile force, a zone of reconnaissance, a locality, terrain objective, or route. A cavalry division can, under favorable conditions, cover a zone of from twenty-five to thirty miles in width. A troop, squadron, or regiment when operating as a single reconnaissance detachment can cover a front of about ten miles. The strength of the reconnaissance detachment is dependent upon the hostile resistance expected, the force available, and other factors. Important enemy activity or difficult conditions of terrain and visibility reduce these frontages.

When the information is to be delivered to the higher commander. This time is governed by two factors, the capabilities of the cavalry and the dependence of any phase of the scheme of maneuver on the information sought.

(3) When the bulk of the cavalry is too far distant to provide local reconnaissance and security for the infantry a small proportion of the cavalry may be attached to the infantry for this purpose. Such cavalry units usually operate as part of the infantry security detachments.

b. Interference with or obstruction of hostile movements, supply, or control.—(1) The purpose of this operation is to limit the enemy's freedom of action in order to protect or facilitate one's own operations, or to weaken the enemy preliminary to or during a decisive action. It is employed in covering an advance in order to provide time for proper deployment or to insure the possession of important terrain. It serves to protect the flanks or rear, to cover a withdrawal, to fill a gap, to delay the approach of hostile

reinforcements or reserves, to block the heads of or otherwise delay retreating columns in order to force a battle (pursuit), to interrupt or destroy hostile lines of communications. The last mentioned—raids against the enemy communications—are usually dangerous and ineffective unless the results are such as to exercise a decisive influence on the success of the general scheme of maneuver.

(2) Essential factors in this mission are: (a) *Interference with hostile movements.—What*: To delay or prevent hostile movements. If practicable the particular hostile force should be specified.

Where: The line or locality beyond which such forces should be held in order to meet the needs of the scheme of maneuver.

When: The period during which the enemy should be so held. If this time seems excessive it should be shortened to come within the cavalry capabilities, or the cavalry should be suitably reinforced or allowed additional space in which to accomplish the delay.

(b) *Raids on hostile communications.—What*: The interference or destruction which is to be accomplished.

Where: The point or locality where such action is to be accomplished.

When: The period within which the operation is to be executed or the interference is to be maintained.

c. Deception.—(1) The purpose of this type of operation is to deceive the enemy as to the operations of one's own force. The cavalry accomplishes this mission by preventing effective ground reconnaissance or by aggressive action designed to create the impression that important operations are occurring in a given locality. An aggressive reconnaissance is frequently the most effective form of deceptive action by cavalry.

(2) The essential factors in this mission are: (a) *Counterreconnaissance.—What*: To hold or drive hostile reconnaissance forces.

Where: Beyond a designated line, locality, or zone. A cavalry division is able, ordinarily, to cover a front which does not exceed twenty miles, a cavalry brigade about sixteen miles, a regiment or squadron about eight to ten miles, a troop not over five miles. These frontages are not rigid.

Wider ones means less effective counterreconnaissance, narrow frontages more effective operation.

When: Period during which enemy reconnaissance operations are to be hindered.

(b) *Other forms of deception.*—This depends on the particular action to be taken but should include the items *what, where* and *when.*

d. Participation in the decisive phase of the battle.—(1) This operation is desirable and may be decisive. It consists usually in an attack against the hostile flank or rear. Such attacks may be made from an initial position on the flank or after a breakthrough. Sometimes, in the defensive battle, the cavalry is employed as a mobile reserve to stop a critical hostile attack. In the attack against the flank or rear every effort must be made to strike at a critical moment with the maximum power. Such action, when combined with a powerful attack by the entire force, is the best guarantee of a complete, annihilating victory.

(2) The essential factors of this mission are: *What*: To attack, capture, defend, or hold.

Where: Objective or defensive line.

When: Time of execution. This should be coordinated with the action of the remainder of the force in order to produce the desired result.

7. PROCEDURE.—To insure the proper employment of the cavalry consistent with simple reasoning and economy of time, the commander may follow a procedure similar to the following:

a. Determine the scheme of maneuver of the main force, considering it according to its successive phases.

b. Determine the desirable general cavalry missions for all phases of the scheme of maneuver and arrange in order of priority.

c. Estimate the strength and availability of the cavalry required for each mission.

d. If there is insufficient cavalry for all missions insure adequate strength for the most important missions by:

(1) Eliminating least necessary missions.
(2) Substituting infantry or other unit where practicable.
(3) Reduce the scope of less important missions and the strength of the cavalry assigned to them.

e. Determine the definite factors, *What, Where, When,* for each mission.

f. Issue the necessary orders, warning or field, in the simplest and most easily understood form at such time that the cavalry will be able to initiate its operations properly.

DEFENSE-SECURITY

(Lecture)

[17 September 1935]

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1. RECONNAISSANCE-SECURITY.—*a General.*—Reconnaissance and security go hand in hand. The purpose of reconnaissance is information and information is the basis of security.

There are certain elements charged primarily with reconnaissance; others with security; some with both. It is difficult to definitely limit, restrict or prescribe the duties of certain units to those of reconnaissance or to those of security.

b. Reconnaissance.—The basic reconnaissance elements of the reinforced brigade, division and independent corps are air service and cavalry. We will emphasize this highly mobile reconnaissance team, comprising air service, horse and mechanized cavalry; each equipped to gather information in its special field in accordance with its capabilities; all closely coordinated and supplementing one another.

The reconnaissance performed by air service and cavalry is largely distant; their relative zones depending upon their capabilities. The presence of these elements in no way relieves infantry elements of the responsibility of close-in reconnaissance.

Air service makes the initial contacts, obtains the first information and orients the ground agencies. In a similar way mechanized units, armored cars, exploit the air service information and orient horse cavalry.

In order to appreciate the depth of this reconnaissance, see Chart No. 1.

Under modern conditions, initial threats will be principally from air, and on the ground, by mechanized units.

The larger the force the more vulnerable it becomes to these threats.

Small units can adjust themselves to meet an unforeseen emergency with greater relative ease and speed than can the larger units—brigades, divisions, corps. The vital necessity for distant air and mobile ground reconnaissance for such units is obvious. The larger the force the earlier must information be available to the commander to meet unforeseen situations.

We stress the fact that existing conditions have made it essential to extend greatly the speed and radius of action of our air and ground agencies and the necessity to rapidly transmit information obtained.

Our reconnaissance must gain time—time is vital for the adoption of adequate security measures for any force—the larger the force the more important the time factor becomes.

Stream-lined reconnaissance agencies operating at great speeds and distances and capable of rapidly transmitting information are essential.

c. Security.—The idea of security is basic in every action in war from the time of the first possible encounter to the final battle.

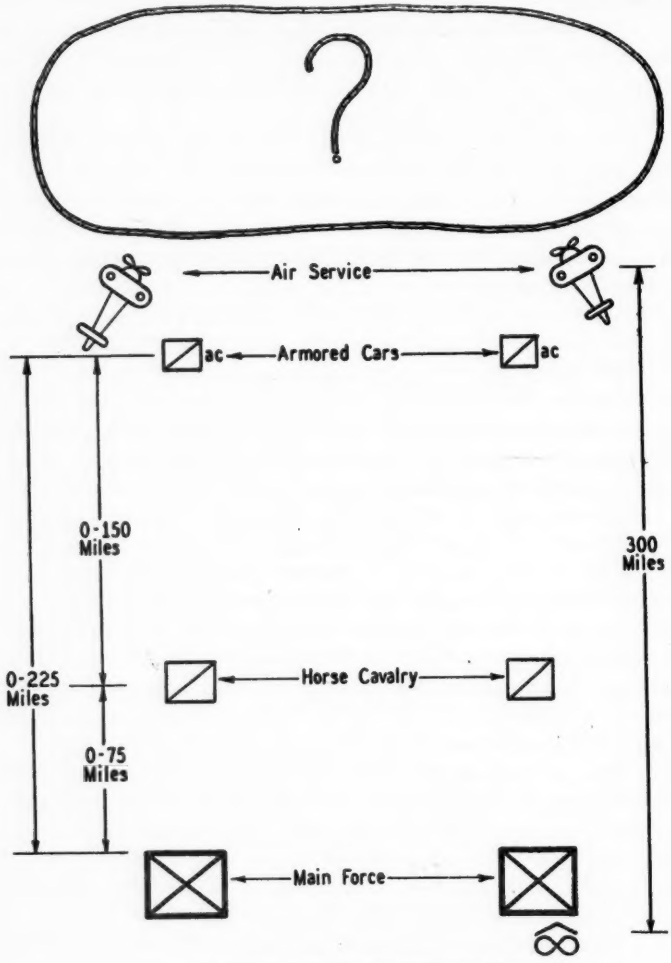
Just as the air service and cavalry are the basic reconnaissance agencies, so in a similar manner the basic combat and security agency is infantry reinforced by artillery, engineers, chemical, signal and other units.

Our conception of security does not envisage security detachments of the old type advance, flank and rear guards anchored to their respective columns operating in accordance with a set formula as to strength, composition, distance and direction. Today the modern conception of security is protection farther to the front, rear or flank in the case of advance, rear and flank guards. The radius of tactical security must be increased and include the entire field of troop dispositions which will guarantee to a commander freedom of action.

For example, we visualize the zone of security for a unit in the advance; as extending from the limits of the air reconnaissance successively through the zone of mechanized or motorized reconnaissance elements, the horse cavalry zone, and finally, into the zone of immediate security handled by the dismounted infantry. See Chart No. 2.

We stress depth of security just as we do depth of reconnaissance.

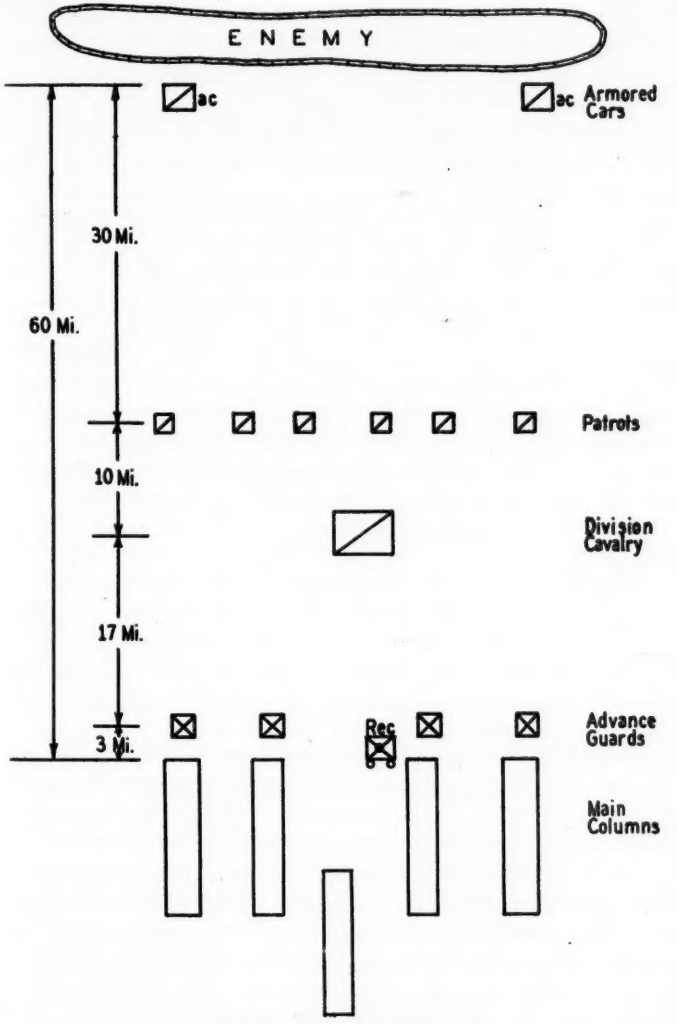
With such a protective screen of reconnaissance elements combing the air and ground to a depth of 200-300 miles, it is difficult to visualize sudden collisions of large bodies. Modern reconnaissance acts as a bumper and practically precludes such occurrences. There will be a series of preliminary meeting engagements between advance security elements



DEPTH OF RECONNAISSANCE

CHART NO. 1

—armored cars, cavalry and mobile reconnaissance detachments. These elements will indicate the hostile contour and with them as a base, the main combat will develop many hours later—no longer with the suddenness of a head-long collision.



DEPTH OF SECURITY

CHART NO. 2

No longer is the security zone confined to the one or more miles at which advance guards formerly operated from main columns; no longer is the guarding against surprise artillery and machine-gun fire a principal mission.

Due to the protective reconnaissance in their front and the presence of motorized units, security detachments can operate well away from the unit employing them; their formation will be very flexible, with troops disposed to give all-around protection.

Our security detachments in general, will be smaller—they may consist of two groups, viz: marching foot elements and foot elements in trucks.

Several factors have contributed to these changes—development in material, the power and suddenness of modern fire, the constant threat from the air, toxic gases, machine guns, long-range artillery and finally, the mechanized ground threat.

2. RECONNAISSANCE DETACHMENT.—This year we will introduce a highly mobile detachment which is basically, infantry in trucks augmented by attachments of truck-drawn artillery, engineers, chemical and signal troops in trucks.

This detachment will be habitually constituted in commands of the size of a reinforced brigade, division and corps, just the same as an advance guard may be constituted.

These detachments are fundamentally agencies of the commander of the unit employing them.

The conception of the employment of this unit differs from the European idea of the employment of their so-called reconnaissance group; their unit is built around cavalry; it is a self-contained, permanently organized unit, functioning under divisional control primarily intended for reconnaissance or security purposes.

Our "Mobile Reconnaissance Detachment" is not a permanent unit; it is brought into being as the situation demands. There may be one of these units in the reinforced brigade and one or more in the division, depending on the situation.

In a division, for example, they may operate initially under brigade control, or they may be held under control of the higher commander, initially, and then one or both be moved over to the column commanders for definite missions if the situation requires such action; or, two or more such groups may be combined and operate directly under the higher commander.

The organization, employment and control will be dictated by the particular situation. There can be no ground-rule for such a unit.

The basic idea of this unit is to utilize motor transportation so as to increase the security, the fighting power and radius of action of the unit to which it pertains. It is a highly mobile maneuvering security element with missions primarily concerned with combat, seizing and holding positions, delaying action, offensive or defensive tactics.

We do not know of any one development that will cause us and has caused us to readjust our ideas so much as this "Mobile Reconnaissance Detachment." However, I believe the need for such a unit in view of the developments that have been made in motorization and mechanization is obvious.

3. SECURITY TEAM.—We will stress the employment of a security team just as we do the employment of a reconnaissance team.

Our instruction will point out the part each unit plays in security and the coordination and teamwork that is essential.

4. FOOT-HORSE AGENCIES.—Before discussing the subject of marches, we want to point out one fact about reconnaissance and security. The School emphatically believes that air service, armored cars, mobile reconnaissance detachments, etc., important, vital and useful as they are, have not and cannot supplant foot and horse elements. There is as yet no machine that can successfully operate under all conditions of weather and terrain. Until such time arises, infantry must still rely on reconnaissance performed by foot infantry and horse cavalry.

5. MARCHES-ADVANCE.—Obviously, marching elements will be effected by the same general agencies, air, mechanization, etc., as mentioned in connection with reconnaissance and security.

The larger the unit the more unwieldy it is; the more ponderously it moves and the more susceptible it is to attack. This is especially true when we deal with units the size of the independent corps.

Our march technique will stress multiple columns echeloned in width and depth. Seldom will our brigades march in single columns—two, three or more columns will be the normal procedure.

Our division will march in brigade groups echeloned in width and depth; within the brigades, a similar echelonment taking place. In a similar manner the corps marches in an echelonment of divisions.

This new march technique brings up many new problems of security, control and communications. Control is decentralized largely to column commanders.

March formations are few, based on probable future employment of the unit, the situation and the road net.

Marching in multiple columns has many advantages; it is easier on troops, increases readiness for combat, is less visible to the air and less vulnerable to air and mechanized attacks. Multiple columns tend to conceal the mass of our forces and our intentions; the enemy is usually forced to adopt similar dispositions to counter our threat.

If there is any doubt of the efficacy of multiple columns, we need only invite your attention to the many changes it has wrought in certain phases of tactical operations. Delaying action in particular has undergone some rude jolts. Principles that were applicable to the delay of long columns that took from one-half to one day to deploy are just as extinct as are such columns.

6. DEFENSE.—We will stress a mobile aggressive defense; a defense that is above the ground rather than below the ground. The spirit of the offense will animate all defensive deployments. We emphasize some form of a counterstroke, counterattack or counteroffensive under all circumstances. The inertia of the stabilized defense is conspicuous by its absence.

By skillful utilization of terrain and employment of reconnaissance and security forces, this defense enables the initial employment of the minimum of holding forces and the maximum of reserves.

Two years ago an offensive maneuver known as the wide envelopment, was developed at this School. Its purpose was to avoid a direct attack on a prepared position; it involved maneuvering the bulk of the attacking force well around and beyond organized resistance—a wide "end run" so to speak.

Last year an attempt was made to develop a defense to offset this wide offensive maneuver. Two methods presented themselves: one, to deploy the maximum holding force on the defensive front resulting in the minimum of reserves;

obviously, with limited numbers available to cover a given front this method of defense could not hope to defend everywhere and still have sufficient reserve power to meet a wide envelopment. The second method was to deploy the minimum of holding forces making available the maximum reserve.

The problem was solved by a combination of this last method coupled with defensive maneuver. In other words, the defense applied maneuver to overcome the attack just as the attack applied it to overcome the defense.

The initial defensive deployment is about as follows: the minimum holding force, consistent with the situation, is deployed on the best available terrain that will block the hostile advance and force the enemy to disclose his intentions. This permits the rest of the force to be held in mobile reserve. Initially, the latter are used to reconnoiter, organize and perhaps partially garrison selected localities in extension of those initially occupied.

During the initial phase of contact, selection and occupation of the position, reconnaissance and security elements have been carrying out their respective tasks.

Once the enemy has disclosed his intentions, reserves are disposed in accordance with the needs of the situation. Some battalions may move to and occupy extensions of the battle position and others moved to more favorable locations to block hostile threats.

The important point to note in this defense is that at least one-third of all units are held mobile. It is through this conception of the use of reserves that this type of defense obtains its elasticity and maneuverability.

In order to successfully defend against frontal attacks as well as those launched deep in flanks and rear, the defense must:

(a) Rely on a highly developed reconnaissance and security system that will insure early information of the hostile mass—block, delay and impede its progress. In other words, prevent surprise and gain time so that our defense can shift its weight in accordance with hostile moves.

(b) Take advantage of the power of organized defense by initially opposing at critical points some troops actually in position and at least partially organized for defense.

(c) Hold out large mobile reserves. Some of which are available to reinforce critical points, garrison some, or to engage in counterstrokes.

(d) Develop its command, communications and supply systems so as to insure the simplicity and flexibility that this mobile defense demands.

PROTECTION OF LINES OF COMMUNICATIONS

[20 September 1935]

	Paragraph
Definition	1
General considerations	2
Importance to combat troops of the continued operation of the services	3
Types of enemy operations to be expected against lines of communications	4
Offensive protective measures against minor operations	5
Defensive measures for lines of communications	6
Use of terrain	7
Artificial obstacles and demolitions	8
Defense of supply establishments	9
Air and ground reconnaissance	10
Conduct of the defense of defended localities	11
Protection of motor convoys on lines of communications	12
Protection of animal-drawn transport	13
Protection of railroads	14
Composition of troops to be employed to protect lines of communications	15
Command	16
Number of troops required	17
Conclusions	18

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1. DEFINITION.—The term Line of Communications for independent reinforced brigades, divisions, and corps, will refer to that area between the *base* and the *combat troops*. Included in this area will be the rear areas and what constitutes a part of the zone of communications of larger units. *The line of communications will be selected of sufficient length to permit the principles of its protection to be applied.*

2. GENERAL CONSIDERATIONS.—*a. Former aspects of protection of lines of communications.*—The problem of protection of lines of communications has been one which has faced commanders for centuries. The commander usually solved the problem by the way in which he disposed and maneuvered his fighting troops. The larger the force relative to its line of communications, the easier it was to do this. The extreme

case was the Western Front in the World War when the front line had to be broken to threaten the communications.

Before the World War, the communications were also protected by defending critical points or important establishments with comparatively small garrisons, or by posting forces of considerable size to cover wide avenues of approach. A good example of this method was Sherman's protection of his communications on his march to Atlanta.

b. Present aspects of protection of lines of communications.—The large scale employment of motorization, mechanization, the complete reliance of modern forces on their rear establishments and the great extent of terrain which may be covered by their rear establishments, combined with the practically total inability of the elements normally on the line of communications to protect themselves against attack by mechanized vehicles and air attack, and the great mobility of modern mechanized and motorized vehicles and airplanes greatly increase the difficulties of providing protection for the lines of communications.

In other words, we find the main armies still moving generally at the rate of speed of the infantry while the communications may be attacked by the modern, speedy mechanized or motorized vehicles and airplanes.

The present situation requires means and methods of defense of the lines of communications which will insure their protection against modern conditions of attack. This protection must be secured by a minimum force, and at the same time insure a maximum effort by the troops directly opposing the enemy.

c. Troops available for protection of lines of communications.—In many campaigns in the past, commanders of advancing forces were compelled to make successive detachments from their main forces to protect their communications. This, of course, weakened the forces facing the enemy.

To prevent this the independent corps, division and brigade used here at the school have had attached a line of communications brigade, regiment and battalion, respectively, composed of "second line troops." These units have been organized for the special purpose of protecting the lines of communications of the force to which they are attached. (See Table 55, *Reference Data*, 1935.)

The rear establishments have thus been provided with a unit organized for the special purpose of their defense.

3. IMPORTANCE TO COMBAT ARMS OF THE CONTINUED OPERATION OF THE SERVICES.—*a. Supplies and reinforcements.*—An independent force in the field must receive the following important supplies and personnel from the rear:

Rations and forage
Ammunition
Gasoline and oil
Ordnance, engineer, medical and signal supplies
Reinforcements and remounts.

b. Rations and forage failure.—Table 22, *Reference Data*, 1935, shows the number of days supply of the first three items in the preceding list in the division and corps. If the communications with the rear were cut so that daily replacement could not be made for a period of three or four days, disastrous results would usually ensue unless the troops could live off the country.

c. Ammunition supply failure.—The resupply of ammunition is not uniform but depends upon expenditures. After two or three days expenditure the ammunition in the division or corps will be expended unless the regular replenishment system is operating. The ammunition supply must be kept open or the troops are helpless.

d. Gasoline and oil.—The division and corps have 3½ days gasoline supply. The increasing numbers of motor vehicles and the great dependence on them for the movement of supplies and troops requires the adequate supply of fuel to operate them. It is possible that the fighting power of modern forces would be more affected by cutting off its gasoline supply than by any other means. Lack of gasoline means immediate immobility for motor vehicles with resulting failure of ration and ammunition supply.

4. TYPES OF ENEMY OPERATIONS TO BE EXPECTED AGAINST LINES OF COMMUNICATIONS.—These enemy operations will be either major or minor in character. The minor operations will be in the nature of raids.

a. Major operations.—In a major operation, the enemy will try to seize and hold decisive terrain, the possession of which will cut the line of supply and cause withdrawal of our whole force or of some large part of our force. Such an operation will be the main blow of a general attack seeking

decisive results by an envelopment or penetration of our front; or the entire enemy force may operate against our line of communications. Such operations will be frequent in mobile warfare where the flanks are open. Responsibility for defense against such a major operation rests with the commander of the force concerned. In such situations, the enemy must be opposed with part or all of the main forces. The protective measures to be described apply particularly to defense of the line of communications against raids and minor operations.

b. Minor operations.—These may be either ground or air operations by forces of varying size against the following objectives on the lines of communications:

(1) Supply depots and other supply establishments.
(2) Supply columns.
(3) Bridges or other critical points along essential railroad or highway supply routes.
(4) Railroad trains.
(5) Command facilities.
(6) Airdromes.

c. Conduct of raids by ground forces.—The raiding force may consist of armored vehicles only, but is more likely to include motorized or mounted units of the different arms.

Operations by a large number of fast tanks when directed against the rear of a force would be considered a major operation as previously defined. In such a situation, they must be met by the use of our own mechanized units and tanks. However, measures described herein for guarding the communications against minor operations and raids by less powerful enemy forces will be useful in giving warning and effecting delay in case of a major mechanized attack.

The raiding force will attempt to pass around a flank or through a gap and reach its objective without encountering any considerable force of combat troops. It will try to gain some degree of surprise and bring superior strength against the troops defending its objective or encountered en route. Should the raiding force capture the objective, it will damage or destroy the installation, train or matériel which is the objective of the raid. The amount of damage will depend upon the time available and the difficulty of the job.

These raiding forces will choose an objective where the ground is favorable for their operation, and where the approaches favor their advance and retirement.

Any inadequately protected depot or establishment on the line of communications would be a suitable objective. All supply columns on the road, unless they have taken defensive measures, would be shot up if discovered.

Finally, the raiding force must make good its withdrawal. In this operation lies its weakness. Usually the force must withdraw by road. It will be exposed to the danger of being cut off by defending troops, and of being captured or destroyed.

d. Probable enemy aerial attacks on lines of communications.—Supply columns and railroad trains will be subject to attack by attack aviation, especially when moving through defiles or on long, straight stretches of the route. The moral effect of an unopposed attack by aviation will be very great. Use of protective measures will raise the morale of the personnel operating the trucks and railroad trains.

Bombing attacks on large supply establishments, airdromes, headquarters and large bridges must be countered by protective measures.

The results secured by aerial attacks upon lines of communications should not prevent its activities from operating provided our air force is at least on even terms with that of the enemy thus keeping the enemy air activity in our rear at a minimum.

Gassing of rear establishments by airplanes would interfere very much with the operation of the supply system.

From the foregoing, it may be concluded that attack aviation interference will probably be only occasional unless the enemy gains a superiority in the air. Bombardment aviation will attack the most vital establishments in our rear.

5. OFFENSIVE PROTECTIVE MEASURES AGAINST MINOR OPERATIONS.—Measures to protect our lines of communications from enemy attacks must include both offensive and defensive operations.

The most certain way of protecting our line of communications is for our main forces, both ground and air, to be successful in front. This success by our main forces compels the enemy to concentrate his attention on the main action and distracts his attention from our rear establishments.

6. DEFENSIVE MEASURES FOR LINES OF COMMUNICATIONS.—In general, the following defensive measures will be taken depending upon the particular situation:

a. (1) Grouping of establishments to be protected into defended localities, or

(2) Defending the entire line of communications by using a cordon defense in extension of the flanks of the fighting units.

b. Protection of convoys on the line of communications.

c. Complete close and distant reconnaissance measures.

d. Provision of a mobile reserve to move to intercept and attack enemy raiding forces.

7. USE OF TERRAIN.—Mechanized and motorized forces are limited to terrain which is suitable for their employment. Strategic movement of these units requires an unobstructed road net which may be interdicted readily at bridges or other defiles. Any body of water more than three feet deep is an impassable obstacle to most mechanized units. Woods or towns offer concealment from both ground and air attack. These localities also hinder the movements of fast ground forces. Roads entering towns can be readily blocked when there is a mechanized or motorized threat.

These factors should be taken into consideration by G-4 in the location of rear establishments, and by G-3 in preparing plans for the protection of the line of communications.

8. ARTIFICIAL OBSTACLES AND DEMOLITIONS.—In mobile operations it will be impracticable to construct elaborate obstacles and the object of the defense of localities on the line of communications will be to stop the advance of the hostile mechanized units by means of demolitions and of simple obstacles in the nature of barricades or road blocks covered by fire.

Bridges over streams leading to the locality to be defended may be destroyed or prepared for demolition in accordance with the situation. These demolitions can be prepared and executed most rapidly by detachments of motorized engineer troops provided with power equipment.

The speed of mechanized units can be greatly reduced by the construction of obstacles which must be removed or

detoured before the advance can be resumed. Suitable obstacles can be constructed from available material either by engineers or by the troops of the locality being defended.

The obstacles should be placed covering bridges, culverts, approaches to fords, cuts, fills, passages through swamps or timber, or other places where a vehicle will have difficulty in detouring the obstacle.

Mines may be used particularly in flat country which because of its lack of defiles offers few locations suitable for the construction of obstacles of the barricade type. Roads which are mined cannot be used by friendly troops. When a tank attack is possible mines surrounding establishments are very effective.

9. DEFENSE OF SUPPLY ESTABLISHMENTS.—With the threat of a mechanized attack we may assume that our supply establishments on the lines of communications of brigades, divisions, corps and army and their transport will usually be grouped on terrain unfavorable to mechanized operation to secure greater protection. These defended localities will also provide places where convoys or detached parties may either find a refuge or receive assistance or protection.

Elements of the line of communications unit will be assigned to defend each of these localities, and any other rear establishments which cannot conveniently be included in one of the larger defended localities.

In certain situations, dispersion of rear establishments and their concealment might be considered preferable to grouping. This would apply particularly where the entire flank was guarded or where there was little threat of mechanized attacks.

However, in the usual case, it is believed some form of grouping is preferable. Dispersed establishments are difficult to conceal if they carry on their regular activities. Also they would be much more difficult to defend against motorized and mechanized raiding forces.

Wherever possible headquarters of units should be located where it will receive the benefit of the protection afforded by one of the defended localities.

10. AIR AND GROUND RECONNAISSANCE.—The measures for securing information of the enemy for the force as a whole should be coordinated with the reconnaissance agencies of the line of communications unit attached. The object should

be the detecting of the presence of the enemy either approaching or operating against the line of communications. Reconnaissance agencies of the line of communications unit must operate at great distances in view of the high speed of possible enemy attacking forces.

Each rear establishment must have its own observers and patrols. All reconnaissance agencies should have signal communications or other means of transmitting the information rapidly to the unit most concerned.

11. CONDUCT OF THE DEFENSE OF DEFENDED LOCALITIES. —Assuming that the foregoing measures of protection have been taken, an enemy raid would be met as follows: Information that an enemy raiding force is operating against our line of communications would be secured and reported quickly, giving its composition, location and direction of advance. All units within its probable zone of operations should receive this information. A particular defense unit, if attacked, would report the fact to the commander of the line of communications force, and defend its position to the last. The previously prepared road blocks would be put in position in rear and, if possible, in front of the raiding force. The mobile reserve would move directly against the enemy or to cut off the raiding force from its base and then attack it.

12. PROTECTION OF MOTOR CONVOYS ON LINES OF COMMUNICATIONS.—*a.* The provisions of Chapter 5, Special Operations, "Protection of Motor Convoys," modified for a particular situation apply. For the larger units especially, there is a great number of motor trucks to be protected. Large numbers of these trucks must be used to supply the fighting forces.

b. In the specific problem of protecting motor convoys operating behind a front line there are three general methods of convoy protection:

(1) By escorts with the convoy.
(2) By a system of detached posts located along or on the flank of the main supply route with a mobile reserve supporting this line.
(3) By a combination of 1 and 2.

c. Motor transportation when not moving should be parked in a locality which best favors the performance of its mission, and which offers the best defensive means as previously described. This will result in most cases in the

bulk of the motor transportation being located in a defended locality in the vicinity of the railhead.

d. When a motor supply column is to start on a mission a last minute report as to the safety of the route to be followed and its vicinity should be available. If an escort is to be used, it should be ready. The great speed of the motor columns is its greatest asset. With the aid of advance and rear detachments designated to act as mobile road blocks it can advance by bounds from one position suitable for establishing a road block to another, or it can delay the enemy by a road block and change direction to escape.

13. PROTECTION OF ANIMAL-DRAWN TRANSPORT.—*a.* In an attack, animal-drawn transport must be grouped closer to the front line than the motor transport. In the defense, it may be grouped farther to the rear. Localities chosen for these groups should have the requirements previously described.

The same defensive procedure should be followed as described for motor transport always bearing in mind the extreme vulnerability of the animal-drawn transport to mechanized attacks. For this reason, no move of animal transport should be made except in case of necessity, when there is a likelihood of a mechanized attack.

14. PROTECTION OF RAILROADS.—A railroad can be attacked effectively at vulnerable points such as bridges, tunnels or in cuts where it would be difficult to clear the line if a train were wrecked. These vulnerable points should be protected by blockhouses constructed for defense against mechanized units. Armored trains should be held as a reserve if available.

The line between the fortified points should be patrolled constantly by motorized patrols to give warning of enemy operations.

15. COMPOSITION OF TROOPS TO BE EMPLOYED TO PROTECT THE LINE OF COMMUNICATIONS.—*a. General.*—(1) The forms of enemy attack upon our line of communications and the methods of defense have been discussed. The employment of the various arms and services in the defense will be considered.

(2) In estimating the situation to determine the composition of the troops to be employed, consideration must be given to means to combat the modern methods of attack which the enemy may be expected to use. Changes brought

about by mechanization, motorization, increased aerial activity, efficient antiaircraft weapons, wide range of reconnaissance agencies, and rapid means of communication and dissemination of information must be considered.

b. Mechanized cavalry.—The situation may require the use of mechanized cavalry for counterreconnaissance and protection of the line of communications. On a counterreconnaissance mission against mechanized units, mechanized cavalry should establish a defensive screen covering bridges or other defiles leading to the line of communications and should hold the greater part of the force concentrated for counterattack.

c. Horse cavalry.—Horse cavalry can be used when escorts for animal-drawn columns are needed. It can be used for reconnaissance and patrolling the line of communications and to the flanks. Armored cars can be used for reconnaissance.

d. Infantry.—Complete infantry units of suitable size must be provided to supplement the defense of service elements and establishments when required. These infantry units should include caliber .50 and caliber .30 machine guns, 37-mm. guns, and riflemen.

Infantry units employed on this duty will occupy by squads, sections or platoons those tactical localities which offer natural protection of trees, rocks, and other obstacles against the fire and crushing action of mechanized vehicles.

A mobile reserve is usually held ready to move to the assistance of one of the defending groups, or to intercept and attack the raiding force. Infantry units, particularly machine guns, caliber .50, in trucks are suitable for this purpose.

Infantry may also be required for duty as guards or escort of confoys or railroad trains.

c. Tanks.—The force commander must decide whether the situation justifies the use of additional tanks for the protection of the line of communications. Their mobility and weapons, using armor-piercing ammunition, would make them useful in the attack of enemy tanks and mechanized units.

f. Field artillery.—The 75-mm. gun is the only adequate means now available for use against the heavier type of tanks. 75-mm. guns are very effective in the defense of protected localities, especially if posted to cover the best routes of

approach. Truck-drawn artillery should form a part of a mobile reserve.

g. Antiaircraft artillery.—The antiaircraft defense of a brigade, division, corps or army should include the localities in which the rear activities are grouped.

h. Air corps.—Aerial observation for the unit as a whole should include observation of the line of communications and its approaches, and transmitting warning of an enemy approach to the line of communications unit or locality concerned.

i. Chemical troops.—These troops as part of the forces defending a locality are of particular value in defense against mechanization. Chemical mortars should be sited to command roads or other good approaches and should be prepared to lay down smoke screens to blind observation of hostile vehicles and to delay their advance. The mortars may also use other chemical agents.

j. Engineers.—The chief role of the engineers is the construction of obstacles and the preparation and use of mines and demolitions. Each group of rear facilities should have some engineers included in the protective force. Engineers are equipped with rifles.

k. Service troops.—In general, service troops must be responsible for their own defense within the capabilities of their weapons, and for the defense of the train or establishment to which they are assigned.

If practicable each truck should be equipped with an automatic rifle or machine gun capable of being fired from the truck.

In many situations the protection furnished by the service troops themselves will not be sufficient and the additional protection of combat troops as previously discussed will be needed.

16. COMMAND.—Command of the protecting forces on the line of communications must be under an officer designated by the commander of the whole force. The troops protecting a particular locality must be under one commander. The commander of the forces protecting the line of communications is responsible that all necessary measures have been taken for the successful conduct of the defense of the unit line of com munications. He has no authority over routes of communica-

tion or supply establishments, except as specifically directed by the commander of the whole force.

17. NUMBER OF TROOPS REQUIRED.—*a. General.*—In this connection, the principal consideration must be the minimum assignment of troops for this mission consistent with reasonable protection of the line of communications against raids.

b. Troops employed.—(1) The number and composition of the troops required is determined after an estimate of the situation giving particular consideration to the nature and amount of enemy activity expected; the extent of the area to be protected; nature of the terrain; amount of traffic to be moved over the routes and the distance it must be moved; number, size and location of structures and establishments to be guarded; sympathies of the inhabitants.

(2) The size of the force detailed to protect a certain locality or column depends upon the importance of the locality or column from the point of view of the force commander; the vulnerability of the locality or column to attack; the size of the locality or column. Sufficient troops should be assigned each locality or column so that it can be effectively protected.

(3) A mobile general reserve will ordinarily be organized and held ready to move to the assistance of the protecting forces or to intercept and attack the raiding force. While the troops assigned to defend the protected localities report and defend, the motorized reserve consisting of caliber .50 machine guns, engineers, some field artillery, mechanized units or tanks if available, a motorcycle detachment and infantry intercepts and destroys the raiding force.

18. CONCLUSIONS.—*a.* A body of troops and methods for their employment must be provided. Attention must be paid to the vital necessity of protection of the rear establishments in modern warfare. Troops originally intended to protect the rear may without disorganization, always be brought to the front if they can be spared. On the other hand, a rearward movement of combat troops to protect the rear area which is being raided might be most difficult and perhaps demoralizing.

b. Depending upon the size of the force and the means available protection of the line of communications may include any or all of the following measures:

(1) Antiaircraft protection to be provided for all important supply installations.

(2) A line of detached posts to protect supply routes from railheads and refilling points forward.

(3) Defended road blocks to be placed on all important flank communications leading into the area containing the supply lines.

(4) An area with all-around defense against mechanized units to be provided for halting places or camps for convoys.

(5) Detached posts to protect vulnerable points on railways.

Armored trains should be provided for the mobile defense of the railway lines.

(6) Mechanized or motorized reconnaissance units to be provided for reconnaissance on the flanks of a line of communication.

(7) Aircraft reconnaissance to furnish the distant flank reconnaissance.

(8) Mobile reserves to be placed at strategic points for counterattacks against enemy forces breaking through the protective lines.

COMPARTMENTS OF TERRAIN

[24 September 1935]

	Paragraph
Previous ideas related to the theory of the compartment	1
Compartment of terrain	2
Physical forms of compartments	3
Tactical influence of the corridor of terrain	4
Use of the corridor for attack	5
Local attacks or attacks of minor forces	6
Influence of terrain corridors upon the defensive	7
Tactical influence of the cross-compartment of terrain	8
Influence of terrain cross-compartments upon the defense	9
Influence of terrain cross-compartments upon offensive operations	10
Advance on successive lines	11
Other forms of compartments	12
Test for value and suitability	13

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1. PREVIOUS IDEAS RELATED TO THE THEORY OF THE COMPARTMENT.—The ideas presented in this text are not offered as being entirely new. The theory of the compartment has been developed from studies of operations in past wars, and especially of the World War. Its principles have been applied in the past.

Previous ideas related to the theory of the compartment are contained in paragraph 428, *Field Service Regulations*, 1923. This paragraph states in part: "Ridges and valleys generally parallel to the front of advance constitute obstacles to the progress of an offensive and natural lines of resistance for the defense. Valleys generally perpendicular to the front constitute natural corridors of penetration; valleys which slope in the general direction of the advance are most favorable to a sustained offensive by reason of the commanding observation afforded by the heights on either side." Similar expressions are found in the Manual for Commanders of Large Units.

2. COMPARTMENT OF TERRAIN.—*a. Definition.*—A compartment of terrain, or a terrain compartment, is an area of terrain which is enclosed on at least two sides (opposite sides) by terrain features which limit terrestrial observation and direct fire into the included area.

The limiting features of a compartment may be ridges, woods, villages, or any other terrain forms which afford defilade.

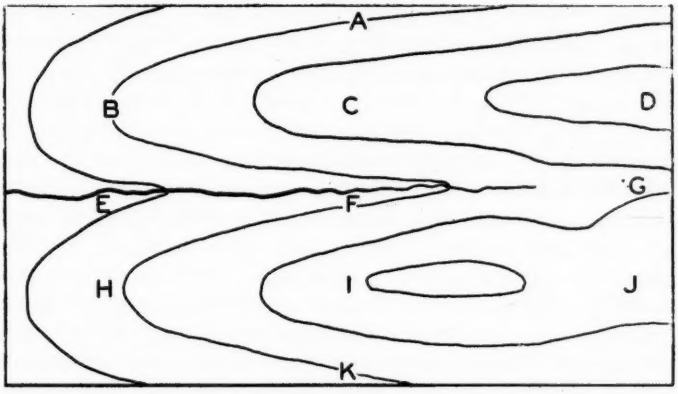


FIG. 1. COMPARTMENT OF TERRAIN.

A simplified, more or less diagrammatic form of compartment is shown in Figure 1. The valley BDJH lying between the parallel ridges BCD and HIJ, is a compartment of terrain. Other examples will be discussed hereinafter.

b. Kinds of compartments.—Depending upon the position and use of a compartment, as discussed below, it may be called either a corridor or a cross-compartment.

c. Corridor of terrain.—A compartment with its two enclosing sides or its general direction pointing toward the enemy, or along the direction of movement of a force, forms a possible route of movement and is called a "corridor of terrain" or a "terrain corridor."

In Figure 1, the valley BDJH would be a terrain corridor for movement in the direction EFG or in the direction GFE.

d. Cross-compartment.—A compartment which lies across (rather than along) the direction of movement of a force is called a "cross-compartment."

In Figure 1, the valley BDJH is a cross-compartment with respect to the movement of a force in the direction AK or KA.

e. Combination of corridors and cross-compartments.—While the general direction of a compartment is usually determined by its limiting features, it may contain within it other compartments which have other directions. For example, the valley type of compartment commonly lies between two parallel ridges, and this type frequently has a stream lying in its axis, the general direction of the compartment being the same as that of the stream and the ridges. However, the stream may have tributaries which lie in small tributary valleys or ravines, the directions of which are across the general direction of the main compartment. Even if there be no tributary streams, there may be, and usually are, ravines or draws running down to the axial stream. Accordingly, a large corridor may contain a number of small cross-compartments, or a large cross-compartment may contain a number of small corridors. Depending upon the nature of these small compartments, their length, width, and depth, and the extent to which they subdivide the larger compartment and restrict fire and observation in the interior, these smaller compartments may modify materially the tactical value of the larger compartment.

3. PHYSICAL FORMS OF COMPARTMENTS.—*a. Prevalence.*—Ridges are found nearly everywhere, and may be realized from a glance at the map accompanying this chapter. The ridges, supplemented by woods and other limiting features, divide practically all terrain into compartments.

b. Varieties of compartments.—A compartment may be large or small, wide or narrow, long or short, regular or irregular. The interior may be open and generally visible from any point within the compartment or, as is frequently the case, the interior may be subdivided into smaller compartments and may also contain considerable cover. The smaller included compartments may be distinctly separate one from another, but are more likely to be connected and to form a branching system corresponding to the branching systems of stream valleys and ridge-lines. The limiting features at the edges of a compartment may be high or low, continuous or discontinuous, and the limitation of fire and observation from the outside may be complete or partial. It should be noted in passing that, in case the limiting edge of the compartment is formed by woods, the compartment is considered to include that part of the woods, near their edge, from which fire and observation can be directed upon the interior of the compartment. Compartments may be enclosed on two or three sides, or completely enclosed on all sides. Compartments may be located diagonally to the direction of movement and thus partake of the nature both of corridors and cross-compartments. These various forms have varying influence upon the utilization of the compartment for tactical operations.

The character of compartments will vary with the general nature of the terrain in an area. In open, gently rolling ground the compartments are usually wide, with extensive interior visible zones. In rougher country, the compartments are often narrow and much cut up into smaller compartments. In flat country, the compartmentation is dependent primarily upon the woods or other vegetation, and may even be non-existent.

At times a series of compartments may exercise the tactical influence of a single long compartment.

Since there are so many variations in the forms of compartments, it will not be surprising to find that there are many which are not distinctly marked.

c. Examples taken from a map of actual terrain.—In considering the attached map, it is evident that the ridge-lines afford an excellent means of studying the compartments, since, neglecting woods and other limiting features for the moment, they mark edges of compartments.

The branching forms of the ridge and stream systems are apparent, and it is also evident that many of the compartments are also branching. However, it is well to examine first some of the simpler forms.

A relatively simple form of compartment is that shown by the shaded area A, lying a few hundred yards north of Galt—Kump P.O. (358-732). This compartment has sides which are esssentially parallel. It is closed at one end by a ridge, and partly closed at the other by woods. There is but little wooded cover included within the interior of the compartment.

Another simple form is the compartment B which includes point (367.5-737.0). This compartment is similar to the one just discussed, but is open at one end.

A form which is considerably more complicated is shown by the larger compartment C which has its center in the vicinity of point (364.0-735.5). The general direction of the compartment is northwest-southeast. There are a number of smaller included compartments, formed by the spurs branching inward from the main limiting ridges. These main ridges, however, generally form the visible horizon of an observer within the compartment. The woods within this compartment further complicate its form.

The valley of Silver Run (D, not shaded on the map) offers still another type. It forms a large compartment with many branches. It will be noted that in the stretch of about two miles west of Silver Run (village), there are practically no branches on the south side, but there are a number to the north.

4. TACTICAL INFLUENCE OF THE CORRIDOR OF TERRAIN. —*a. Covered avenues of approach and attack.*—A corridor of terrain, when suitably formed and located, and of a size reasonably well adapted to the force, whether a battalion or a division, which is to use it, constitutes one of the most advantageous approaches for an attacking force. The reasons for this are shown below.

b. Protection against defender's observation and fire from outside the corridor.—Troops advancing within a terrain corridor are defiladed more or less completely from the direct fire of enemy weapons emplaced outside of the corridor. The defilade from direct fire is particularly effective against flat-trajectory weapons, such as machine guns (the

backbone of the defense), rifles, automatic rifles, one-pounders, and anti-tank artillery. Since the systematic organization of defensive fires is the great advantage of the defense, this limitation upon the enemy is very favorable to the attack. In a similar way, the corridor limits terrestrial observation from outside the corridor, including observation for command purposes and observation of fire. The limitation of artillery observation is especially important, since the effectiveness of artillery fire depends upon this observation. These considerations show that the corridor tends to eliminate practically all direct fire and terrestrial observation from outside.

The disadvantages of attacking along a ridge instead of within the corridor between two ridges are discussed more fully in *Influence of the Terrain upon the Assignment of Command Areas and Boundaries.* (See pages 135-140, RML No. 57, June 1935.) However, it may be mentioned here that a unit attacking along a ridge is subject to direct fire from troops of the defender that are located not only in one compartment but in two compartments, that is, in those compartments lying on both sides of the ridge in question. If, on the other hand, the attacking unit advances in the single compartment (or corridor), only the enemy in that one compartment is able to deliver direct fire upon that unit. In the first case the volume of direct fire which the defenders can deliver upon the attacking unit is far greater than in the second case.

c. Neutralizing the defense within the corridor.—There remains the defender's direct fire within the corridor, and also his indirect fire that is controlled by terrestrial observation within the corridor and by aerial observation. Leaving the aerial observation to be neutralized by anti-aircraft measures, the attacker can concentrate attention and power upon the neutralization of the direct fire and terrestrial observation within the corridor.

With effective neutralization of much or most of the fire and observation within the compartment, combined with the protection which the corridor affords against direct fire and terrestrial observation from without, the attacker can advance within the corridor with a relatively high assurance of success.

d. Terrain factors.—(1) *As a basis of examination of the terrain corridor.*—It is well further to examine the conception of the terrain corridor in terms of the universal terrain factors of observation, field of fire, cover, obstacles, and communications.

(2) *Observation.*—In a terrain corridor, the attacker's observation extends forward in the direction of his advance, and, if the the compartment is a valley, the observation from the side ridges is usually very advantageous. Although the defender has observation within the compartment, the attacker will endeavor to neutralize it, while the defender's observation from outside the compartment is more or less completely cut off by the enclosing features of the corridor. The defender is thus hampered by difficulties of bringing observed fire, from without, to bear upon the compartment or compartments in which the attacker has chosen to deliver his blow.

If the corridor is a valley, its upper end is usually closed by a ridge, which frequently affords commanding observation over the corridor. The force, attacking or defending, which occupies the upper end of a valley corridor usually possesses this advantage, and, in facing down the slope, usually has better command than has its adversary. It is the defender who most often occupies the upper end, since he usually selects his terrain, but if the conditions are reversed and if the attack can be made downward along the general slope of the valley, the situation is especially favorable to the attacker.

If a corridor extends deeply into the defensive position, it frequently permits the attacker to observe and support his attack for a great depth with less movement of his observation posts. This lessens or removes the necessity of a pause in the attack which might otherwise be required for displacement of observation posts. However, it is not without advantages for the defense, for it affords a greater length of side ridge from which observation can be used, and it permits the defender, from observation posts deep within his position, to continue observation of the attacker's troops for a longer period, and sometimes to enfilade the attack from the front.

In general, a corridor which pierces the defender's position is more advantageous to the attacker than one which just reaches it or stops in front of it.

It should be mentioned, in passing, that either the attacker or defender may benefit from a corridor which extends deeply into the other's territory, furnishes observation of the other's rear areas, and perhaps adversely influences the operations of the adversary's reserves or the movement of his supplies.

(3) *Field of fire.*—The considerations concerning the factor of field of fire as related to corridors are almost identical with those discussed for observation. The ability of machine-gun units to deliver overhead fire from positions on the side slopes should be mentioned. Also, the defender is especially able to coordinate the cross-fires of his machine-guns within the corridor, though, as previously discussed, each compartment is more or less isolated from the adjacent compartments, and fires from one compartment into another are difficult.

(4) *Cover.*—In addition to the protection against observation and fire from points outside the corridor, there is frequently cover within it. A valley usually contains a stream, intermittent or permanent, and along the stream there are usually woods, sometimes wide and thick, sometimes composed of only a few trees. The stream may lie in a gully. Often there are other trees or woods in addition to those along the stream. These features afford cover, including concealment from aerial observation, for the advance of the attacker.

A corridor which is completely bare, and thus offers favorable fields of fire to the defender, is less advantageous to the attacker than a corridor which includes trees or other cover within it. Even though the attacker is protected against fire and observation from outside of the corridor, his task is facilitated by such interior cover, which assists in protecting the advancing troops.

(5) *Obstacles.*—Though the compartment may contain various obstacles, those most frequently found are the streams usually located in valleys, which latter constitute one of the most common types of compartments. However, in the case of a valley leading toward the enemy, the main stream lying in its axis is not usually so located as to bar

the advance, though it may interfere with lateral communication or may have tributaries of lesser importance which form obstacles across the line of movement.

If the axial stream of a valley corridor is unfordable or otherwise constitutes a difficult obstacle, this obstacle involves great disadvantages because it divides the attacker's force and prevents or seriously hampers lateral maneuver and cooperation between the parts of his force. The disadvantages are increased if the stream meanders in wide curves.

(6) *Communications.*—Though there are many exceptions, there is somewhat of a tendency for communications to run along rather than across the lines of ridges and valleys. Hence the valley type of corridor is likely to have communications running along it, which condition is usually favorable to the attack. Again, communications which follow the valleys are usually less exposed than those lying along or across ridges.

e. Conclusion.—It is thus seen that the concept of the corridor, that is, a compartment lying perpendicular to or piercing the enemy's front, usually implies a combination of terrain factors favorable to the attack. It affords a suitable avenue of approach and attack, and favors infiltration and penetration.

To the same degree the corridor is unfavorable to the defense.

5. USE OF THE CORRIDOR FOR ATTACK.—*a. The main attack.*—It is evident from the preceding discussion that it is advantageous to concentrate the effort in a terrain corridor and that the corridor in turn facilitates the concentration of power upon a limited front. A corridor is therefore a favorable location for the main attack.

Even though the main attack be delivered in the form of an envelopment, it is usually desirable to utilize a corridor or other covered avenue of approach (see Chapter X), because the elements comprising the enveloping force may be compelled eventually to deliver a frontal attack against units of the enemy which will have been moved into position to extend the defender's flank and to bar the advance.

A terrain feature forming a compartment boundary and lying between the enveloping attack and the holding attack

tends to free the enveloping attack from interference by troops located on the enemy's original front.

b. Selection of a terrain corridor.—The selection of a terrain corridor for the location of a main attack should be based upon the considerations applicable to the offensive, including the direction of the decisive terrain objective or other decisive direction, the suitability of the terrain for the use of the weapons in which the attacker possesses a preponderance, and the desirability of favoring the main attack as much as practicable by assigning it, consistent with other necessities, the most advantageous corridor. Where there is a choice of corridors, that one should usually be selected which favors securing the most important results in the easiest manner.

c. Discontinuous corridors.—It will frequently be the case that the available corridors do not extend continuously in the desired direction of attack, especially since the defender may be expected to locate his position along a cross-compartment, which usually breaks the continuity of corridors. In such case, the solution may well be to use a series of short corridors. Cross-compartments frequently include a number of smaller compartments within or running into them and forming corridors which can advantageously be employed.

The endeavor should be made especially to secure to the various attacking units the benefits of corridors or other covered approaches in the part of the advance at which those benefits are most needed. The need is greatest when the attacking troops come under the concentrated fires of the defender's principal defenses. Hence, the value of a corridor is greatest just in front of and within the defensive position.

d. Parts of the attack other than the main attack.—As will be discussed more fully in Chapter X, *Terrain in the Offensive*, the parts of the attack other than the main attack will also, where practicable, utilize corridors, especially to concentrate their principal efforts.

e. Neutralization of full width of corridor.—The attacker should, generally speaking, attack the full width of the corridor, from edge to edge, at least with fire. The troops themselves need not, and often will not, occupy the entire frontage in their movement, but will generally move

through covered areas and avoid open areas, though delivering fire upon the defenders throughout the width of the corridor. If the attack is delivered against only a part of the corridor, as, for instance, against its middle or against its flanks, and the attacker thus fails to neutralize the enemy's fires over the full width of the corridor, the flanking fire from the neglected part may stop or check the attack. In other words, failure to attack the entire corridor may lead to defeat. To repeat, the enemy throughout the full width of the corridor should be attacked.

f. Size of corridor and size of attacking unit.—It is evident, from the preceding, that a corridor utilized for attack and the force available to make the attack should be suited to each other.

As an example of what might happen in case of attack in a corridor too large for the attacking force, let it be supposed that a force, capable of making an attack of desired strength on a frontage of about one mile, is assigned to the attack of a corridor that has a width of three miles. The attacking force cannot neutralize the defenses within the whole corridor, which forms a sort of ampitheater or bowl surrounding the zone within which the attacking force is advancing. From this bowl the defender's weapons, only a part of which are subject to neutralizing fires, can concentrate their action to the almost certain defeat of the inadequate attacking force.

Since a failure to neutralize important elements of the defense within the corridor may permit the enemy, by flanking fire, to check the attack in other parts of the corridor, the responsibility and command within it should preferably be given to a single unit or a single commander, who is thus enabled, as far as practicable, to control the attack against all defensive elements which are opposing his action. By this means it is frequently possible to make the tasks of various units more definite, and more closely to proportion the strength of the various parts of the attacking forces in accordance with their tasks. Furthermore, the failure of a unit attacking one compartment has less tendency to compromise the attack of a unit in an adjacent zone of action, since the latter unit is in a separate compartment.

The size of unit, whether a battalion or a division, which is assigned to the attack of a given corridor will be in-

fluenced by the width of the corridor. If the frontage of attack within the corridor is too great for a given unit, the corridor may be assigned to a larger unit, the commander of which unit coordinates and concentrates his available means of action toward the attack of the corridor as a whole. Or, as another solution, that corridor may be avoided and a smaller one may be used. On the other hand, if the size of the force is too large for a given corridor, more than one corridor may be used, or, in a suitable case, the force may be reduced by detaching a portion as reserve.

In short, the corridor may be selected to fit the attacking force, or the force may be adjusted to fit the corridor.

g. Neutralization of the corridor in depth.—The fires of the attacker should not only neutralize the full width of the corridor, but they should also cover a certain depth, in order to neutralize weapons which are located in rear of the enemy's front lines and which fire upon the attacking infantry. The fires supporting the attack at any moment should therefore extend to sufficient depth to reach the defender's weapons which are within range of the advancing infantry, or, in case the corridor is closed at the end toward the defender, the depth of the fires directly supporting the attack need not extend beyond the terrain feature which closes the end of the corridor. Since the range of the observation utilized by the defender's artillery is usually greater than the range of the defender's weapons which lie within the corridor, fires intended to neutralize that observation may extend to a greater depth than is necessary for the fires directed against those local weapons.

h. Influence of gas upon the use of corridors.—If the enemy uses gas, allowance must be made for the fact that woods or low ground which have been occupied by him or which lie within range of his artillery or chemical weapons may be neutralized by gas. The bottom of a valley corridor may therefore be gassed; however, in such case, the attacker need not necessarily abandon the use of the corridor, but he should endeavor to utilize those parts of it which are not contaminated, such as the slopes at the sides of the valley. In some cases, the gas will prevent the use of the entire corridor, and another corridor, or other avenue of approach and attack, must be sought.

i. Compartments not always advantageous or available.—Although compartments are usually advantageous, this is not always true, and it may sometimes be necessary to avoid undesirable compartments and to operate elsewhere.

For example, within the interior of a corridor there may be included cross-compartments that have such strong disadvantageous characteristics as to more than overcome the advantages of the main corridor. If there exist, at the same time, favorable wooded avenues of approach and attack which permit the shoulders of the compartment to be captured readily, the maneuver may well be planned to outflank the compartment and take it from its commanding shoulders. However, this is a procedure which should be selected with caution.

Compartments may be very small, and when they are bounded by woods and lines of trees which lie closely together, the compartments may be practically non-existent. In this case, the observation has little value. The attacker cannot support the attack for any great distance without moving his observation posts. The compartmentation of the terrain may then, in most cases, be neglected, and the terrain treated practically as a continuous wooded area.

j. Tendency to misapplication.—Experience in the study of corridors in tactical situations shows that some students tend to misapply the conception of the terrain corridor, employing it like a rule of thumb, and without reasoning, in every situation.

A terrain corridor may not be suitable to the purpose in view; it may be much too large or much too small for the forces to be used; it may not lead in a direction that is decisive or important. While a corridor usually involves a combination of terrain factors favorable to the attack, this may not be the case, and the mere fact that it is a terrain corridor does not make it suitable to the maneuver. It not infrequently occurs that some other terrain area or combination of terrain features is more favorable for the contemplated operation. The compartment is not an end but a means, and it is not an invariably favorable means. Hence, the finding of a corridor may not solve the question of the location of attack, though it is usually a step in the right direction.

k. Utilization of valleys for movements distant from the enemy.—The full influence of the corridor as a favorable route of movement for an advancing force is felt when the force is within the zone of hostile observation and fire. However, there has been some tendency to discuss the use of the corridor in connection with the movements of forces distant from the enemy. This conception should be used only with caution. Though the existence of a valley compartment frequently carries with it the existence of favorable communications, and though there are likely to be some favorable elements of cover, the principal tactical advantages which are implied in the conception of the corridor of terrain may be almost entirely lacking. It is therefore usually preferable in this connection to discuss the benefits of terrain in the far more applicable terms of the terrain factors of communications and cover.

6. LOCAL ATTACKS OR ATTACKS OF MINOR FORCES.—The corridor of terrain is useful in advance guard action, in reconnaissance in force, in the series of local attacks which comprise the process of driving back the enemy's outpost or covering troops, in raids, and in similar cases in which parts of a force are used with the intention of obtaining local results. The relatively small force making such an attack thus has flank protection against observation and fire, the fires of the attack can be concentrated to increased effect, and the results obtainable from the action of a small force are materially increased.

7. INFLUENCE OF TERRAIN CORRIDORS UPON THE DEFENSIVE.—*a. In general.*—In the defensive, the influence of terrain corridors is exercised in two principal steps, first, in a study as to which corridors, if any, the enemy may utilize, and second, in defending those corridors.

b. Study of corridors.—A study of the corridors which may be utilized by the enemy, and the manner in which he may be expected to use them, is made in accordance with the principles applicable to the offensive, bearing in mind the known offensive tactics and habits of the particular enemy.

In this respect, the advantage of the initiative possessed by the attacker stands out strongly. He can determine for himself which corridor, if any, he will use, and can concentrate his means at the point of main attack. On the other hand, the defender must be prepared to defend a

number of corridors, and though his terrain study should indicate a priority as to the probability of their use by the attacker, he cannot hope to concentrate at the critical point all of the defensive means that he would desire.

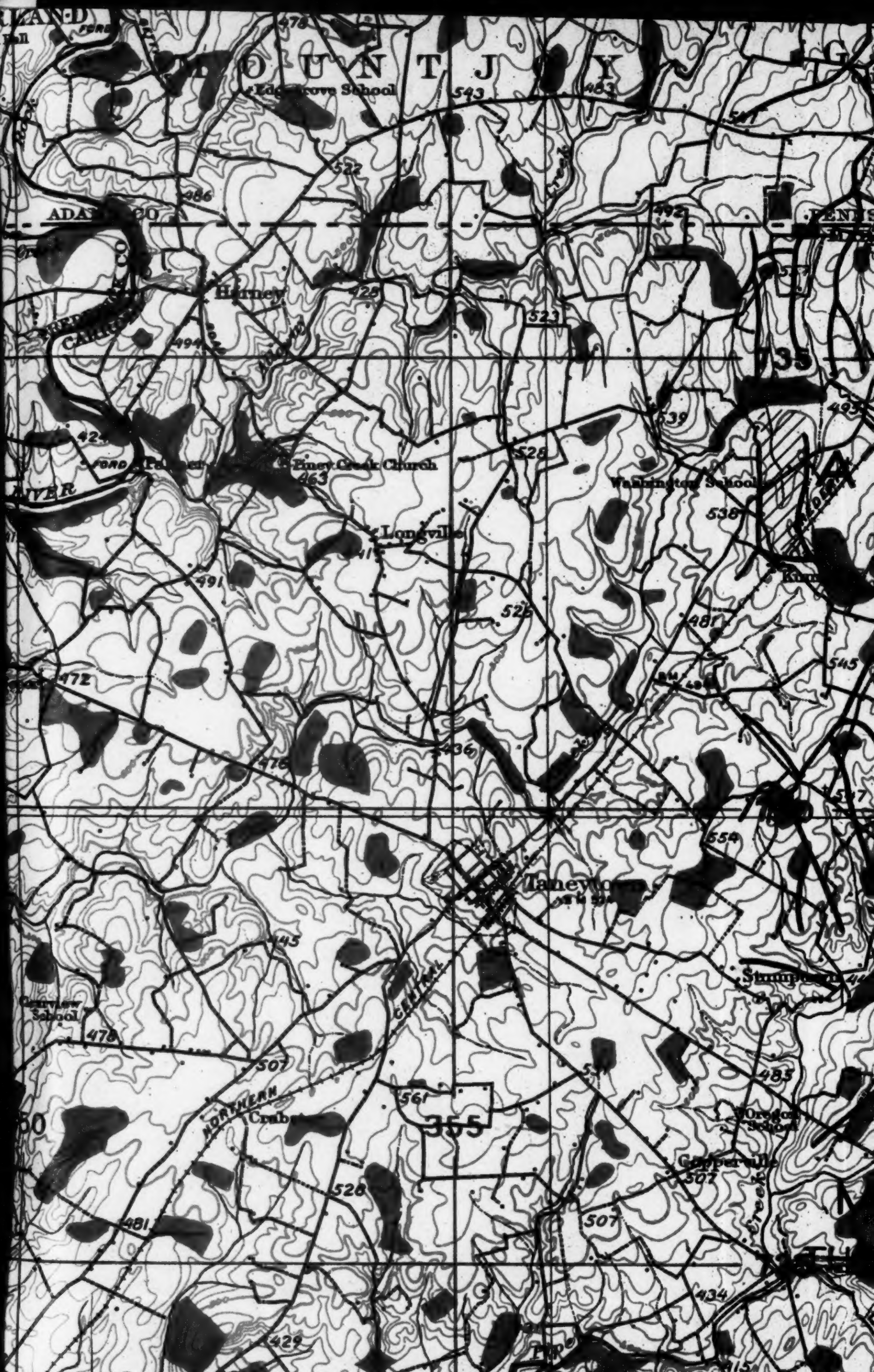
c. Defense of corridors.—(1) *Defensive fires.*—As has been shown, the very nature of the terrain corridor is such that it interferes, by means of the terrain features along its sides, with flanking fires from outside of the corridor, though it favors the organization of fires within it. The defender can counteract this disadvantage in part by endeavoring to select terrain in which there are no corridors or penetrating compartments, advantage being taken as far as practicable of cross-compartments, which latter are favorable to the defensive organization. (See paragraphs 8 to 10, hereinafter.)

Such corridors as cannot be avoided should be made, in order of importance, the objects of special precautions by the defender in order to bar the attacker's advance by fire. The defender endeavors to stop the advance in the corridor by organizing fires, especially flanking fires, across it. The terrain advantages of the high ground usually found on the shoulders of the corridors generally lead the defender to occupy them in strength, while covering the lower parts of the corridors thoroughly with fire. In addition, the defender should especially seek to secure flanking fires from each corridor into the adjacent ones. In addition to infantry fires, the fires of artillery and other supporting weapons are placed upon the corridors, in priority of their importance.

(2) *Observation.*—In order that the attacker may not fully succeed in neutralizing the defender's observation of the corridor, the defender should have alternative observation posts within the compartment, and should also seek to obtain observation of the compartment from higher ground in rear or to the flank.

8. TACTICAL INFLUENCE OF THE CROSS-COMPARTMENT OF TERRAIN.—*a. In general.*—It will be of value to examine in theory the cross-compartment of terrain in much the same way as has previously been done for the corridor.

It should be remarked that the presence of a cross-compartment, with its limiting features lying across the direction of movement of a force, tends to prevent the existence



O U N T J
Harney
Piney Creek Church
Longville
Taneytown
Washington School
Sharretts
Crabb
NORTHERN
CENTRAL
RIVER
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434
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415


MAP SHOWING RIDGE-LINES
THE COMMAND AND GENERAL STAFF SCHOOL
FORT LEAVENWORTH, KANSAS
TO ACCOMPANY
TERRAIN CHAPTER III

of important corridors. However, this statement must be made with some reservation, due to the greatly varying shapes of compartments. (See subparagraph 3 *b*.)

b. Observation and field of fire.—In a cross-compartment the observation and fields of fire are practically continuous across the front throughout the length of the compartment. When a defensive position has been located along a cross-compartment, observation from one part of the position can therefore be used to control fire in front of other parts of the position. This fact constitutes a distinct advantage to the defender, for it permits him to concentrate observed artillery and infantry fires upon various parts of the front without changing installations, and without the restrictions imposed by the limiting terrain features of corridors. Above all, the cross-compartment is important because it favors the development of a system of fires, composed of the crossed flanking fires of machine-guns combined with fires of other weapons, which is continuous across the front. Therefore, where a cross-compartment is utilized, that part of the defensive position which must be neutralized by the attacker is relatively wide, and does not usually have defined limits to the flanks, as has the corridor. As a result of these considerations, an attacking unit usually cannot neutralize all of the fires bearing upon it, but must depend for assistance upon adjacent tactical units. Therefore, responsibility becomes less clear-cut and more dependence must be placed upon cooperation between adjacent units.

The breadth of the cross-compartment, measured toward the front, usually fixes the limits of the defender's observation and fields of fire, which are usually most favorable in terrain which has large compartments. Where the compartments are smaller, the conditions are less favorable, and when the compartments are very small, as in an almost continuous wooded area, the observation and fields of fire are unfavorable.

The attacker's observation and fields of fire are limited by the terrain feature which closes the compartment on the defender's side. Therefore, in so far as the effect of the attacker's weapons is concerned, his attack is well supported until it reaches that terrain feature, but the support thereupon suffers a material reduction in effectiveness

until such time as the artillery observation and infantry supporting weapons can be moved forward to command the next succeeding compartment.

Successive cross-compartments in or in rear of the defensive position afford the defender observation and fields of fire for successive defensive areas within a position, for covering detachments in case of forced withdrawal, or, especially, and for successive positions for retrograde movements, including delaying positions and rear-guard positions.

c. Cover.—The limiting feature on the defender's side of the cross-compartment affords cover to his troops, while the similar feature on the opposite side affords cover to the troops of the attacker. The attacker is thus enabled to assemble under such cover and to advance in relative security until the cross-compartment is reached; the defender is enabled, in relative safety, to hold or to maneuver his reserves and to maintain his rear installations and defenses until the attacker passes beyond the compartment in question. The limiting features of the compartment especially favor the emplacement, for each force, of artillery sheltered from the observation of the opposing force.

As the attacker crosses the crest of a ridge forming the limit of a cross-compartment, his forces, especially his tanks, may be seriously exposed to fire and to observation of their movements. Covered routes for their movements across crests are especially desirable, but may be lacking. A similar danger is found, but to a lesser degree, in the debouchment from woods, not because the troops are more exposed to view than elsewhere, for the contrary may be true, but because the opponent is especially vigilant in observing the edges of woods from which the attacking troops may emerge and because the edges of woods afford excellent artillery targets.

Within the interior of a cross-compartment there may be cover, including trees, gullies, and small folds in the ground. However, the fringe of trees found so frequently along the line of the axial stream lies across the direction of the attacker's advance and is not, therefore, so located as to constitute a covered avenue of approach.

The cross-compartment also affords cover for attacking troops during pauses in the attack or halts for reorganization.

d. Obstacles.—In the cross-compartment, the axial stream is located across the direction of movement of the attacker, and its influence as an obstacle constitutes one of the great advantages of the terrain cross-compartment to the defense. The effectiveness and especial need of such obstacles against tanks are elsewhere discussed. The defender should, however, take precautions to insure that the gully of the stream be not utilizable by the attacker as an effective trench line to cover his troops during a step in the advance.

e. Communications.—See sub-paragraph 4 *e* (6).

f. Conclusion.—In a manner analogous to that followed in the case of corridors, it may therefore be concluded that the cross-compartment usually implies a combination of terrain factors favorable to the defense and unfavorable to the attack.

9. INFLUENCE OF TERRAIN CROSS-COMPARTMENTS UPON THE DEFENSE.—The influence of the cross-compartment upon the defense has been presented rather fully in the preceding discussion. It is barely necessary to summarize it, to say that the defender should endeavor to select, as the terrain basis of his position, a cross-compartment which is as nearly continuous across the front as possible. It should be broken by corridors as little as possible. In order to permit distant observation and long fields of fire, it should be as broad as practicable, and may well be practically without limit on the attacker's side. It should contain suitable obstacles.

10. INFLUENCE OF TERRAIN CROSS-COMPARTMENTS UPON OFFENSIVE OPERATIONS.—The influence of the terrain cross-compartment upon offensive operations is less apparent and more complicated.

The fires of the attacker being, as discussed in subparagraph 8 *b*, variable in effectiveness under the influence of the terrain and of changes in the situation during the action, the attacking troops will move more rapidly in some areas, more slowly in others, and will pause or be checked in others. The advance will be more or less by bounds, and these

bounds will be determined to a large extent by the compartmentation of terrain.

11. ADVANCE ON SUCCESSIVE LINES.—In the advance on successive lines, which procedure may be utilized for purposes of control and security in difficult terrain, or when there may occur a meeting engagement with an aggressive enemy whose situation is only vaguely known, or under certain other conditions, the successive lines are laid out largely in accordance with the cross-compartments of the terrain.

Since the advancing commander desires to prevent the columns of his main bodies from coming suddenly and unexpectedly under the observed fire of enemy artillery, the advance guards should have the mission, in each step of the advance, to secure control of the observation points or areas which command any given terrain cross-compartment before the main bodies enter that compartment. Accordingly, the main bodies and the advance guards advance on successive lines from one cross-compartment to the next, or otherwise stated, usually from one ridge to the next. The successive lines should be suitable for defense by the entire force, or for defense by the advance guards while the maneuver of the main force is being organized behind them. The bounds of the main bodies and of the advance guard are not necessarily simultaneous, there being considerable extension and shortening of the distance between them. The distances covered between successive lines will be influenced by the breadth of the cross-compartments, the effective range of the enemy's artillery, and the distance by which the advance guards can afford to separate themselves from the main bodies.

12. OTHER FORMS OF COMPARTMENTS.—While the forms of compartments most frequently encountered are, first, the valley, lying between parallel ridges, and second, a space of open terrain lying between wooded areas, there are other forms.

For example, it may occur, as in the enveloping attack, that the enemy's forces are located only on the inner flank of the zone of advance of the main attack, while the outer flank of the enveloping force is entirely free. From the point of view of the attacker, it is very advantageous to have a limiting terrain feature which restricts the defender's

fire and observation from the inner flank, but it is not necessary that there be one on the outer flank. This arrangement, while not strictly a compartment, has the same tactical effect.

In a similar way, if the part of the defending force which is located upon one flank of the attack is so far away as to be unable to fire effectively upon the advancing troops, the attacker may be said to be protected on that flank by distance, and the tactical effect is still the same as though a restricting terrain feature were found along that flank.

Or, again, a stream which is especially difficult to cross may lie along one flank. Although the stream would not prevent observation and fire from any enemy which might be found upon the opposite shore, the difficulty of crossing the stream may make it impracticable or extremely unlikely that enemy troops would be found there, and the influence of this obstacle is then similar to the enclosing effect of a ridge lying along the edge of a terrain corridor.

13. TEST FOR VALUE AND SUITABILITY.—As is apparent, the advantages and disadvantages of any type of compartment will vary greatly with the existing conditions and, in any particular case, the value and suitability of any compartment, or of any terrain feature or area whatsoever, can be examined and weighed through a consideration of the five universal terrain factors of observation, field of fire, cover, obstacles, and communications.

ORGANIZATION AND EMPLOYMENT OF RECONNAISSANCE DETACHMENTS

[15 October 1935]

	Paragraph
General	1
Modern conception of security	2
Term	3
Basic purpose	4
Tactical employment	5
Organization	6
Command	7
Place in column	8
Motor transportation	9
Protection for the detachment	10
Liaison	11
Reconnaissance agencies with the detachments	12
Symbol	13

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1. GENERAL.—The following notes form the basis for the organization and employment of Reconnaissance Detachments for employment with the reinforced brigade, the division, and the corps, and give information which may be used for further study on the subject.

2. MODERN CONCEPTION OF SECURITY.—*a.* Reconnaissance and security go hand in hand. Information is the basis of *security;* the purpose of *reconnaissance* is to secure information. The idea of security is basic in every action in war from the time of the first possible encounter to the final battle and it must at all times be uppermost in the thoughts of commanders of all echelons.

b. The time is past when the point of the advanced guards pushed some 3000 to 5000 yards forward (which distance was based primarily on the effective range of the light gun), can be counted upon to give complete security to the main body. Today the modern conception of security is protection farther to the *front, rear* or *flank* in the case of advance, rear, and flank guards.

c. The radius of necessary tactical security must be increased and must include the entire field of troop dispositions which will guarantee to the commander freedom of maneuver. We visualize the *zone of security* for a unit in the advance, for example, as extending from the limits of the air reconnaissance successively through the zone of the mechanized or motorized reconnaissance and security elements, the horse cavalry zone, and finally into the zone of immediate security handled by the dismounted infantry.

d. The above is necessitated by the great development in material, the power and suddenness of modern fire, and the fact that there is a constant threat from the air, from toxic gases, from machine guns, and from mechanized and motorized elements, as well as from long range artillery.

e. Thus, there will be no longer the sudden "meeting engagements" of the old type between large bodies of troops modernly equipped. The meeting of the larger bodies will have been preceded by a succession of meeting engagements of small reconnaissance and security detachments.

3. TERM.—*a.* The generic term for the detachments, referred to in Paragraph 1, is RECONNAISSANCE DETACHMENTS. The particular detachment will be further designated by the name of the unit of which it is a part, as "Brigade," "Division," "Corps." Example, BRIGADE RECONNAISSANCE DETACHMENT.

b. Where there is more than one such detachment in a unit such as a division, they will be called: "DIVISION RECONNAISSANCE DETACHMENT NO. 1," "DIVISION RECONNAISSANCE DETACHMENT NO. 2."

4. BASIC PURPOSE.—*a.* The *basic* idea is to utilize motor transportation so as to provide a highly mobile combat force which is available:

(1) To increase the security of the unit (security detachment, column, etc.) with which it is working.

(2) To increase the radius of action of the several columns, through mobile fire-power.

(3) To enable commanders to have a mobile detachment available for fighting purposes to quickly cover the movements of the column.

(4) To provide commanders with a mobile unit which is capable of quickly seizing and holding terrain until the arrival of foot troops.

The reconnaissance detachment supplements the duties of division cavalry, but does not supplant it. It allows the division cavalry during the advance and while contact is being made to be used primarily for its principal roles—reconnaissance and close-in security for the division. It enables the commander to support the cavalry in overcoming resistance. Finally, it tends to insure the availability of the horse cavalry for horse cavalry missions, by releasing it from missions that can be and are better performed by motorized

infantry, saving the horse cavalry for the day when its role becomes paramount,—when due to fog, rain, weather or terrain, it will be the ONLY agency which can perform the necessary reconnaissance and security missions.

5. TACTICAL EMPLOYMENT.—*a.* The Reconnaissance Detachment is concerned primarily with *security* and *combat.*

b. As part of the security force, the Reconnaissance Detachment will be used to clear the way of enemy small units and obstructions for the advance of the main body; while the foot troops of the security elements (engineers and infantry) will repair roads and bridges and furnish the local security for the main body and the protection for the detachment which must do the pioneering.

c. Some of the missions for which the Reconnaissance Detachments may be used are:

(1) Reconnaissance *in force* where it is necessary to assist the purely reconnaissance vehicles or the horse cavalry in clearing up road blocks covered by automatic weapons, enemy delaying detachments, etc.

(2) To seize and hold advanced positions until the arrival of foot or horse elements.

(3) It can be used in delaying actions.

(4) It can be used as a mobile element of a rear guard, in which case it may be attached to the rear guard commander.

(5) It may be used to advantage as a mobile element of a flank guard. In such a situation, if it appears that the unit may not be needed elsewhere, it may be attached to the flank guard commander. If that flank guard commander also has cavalry attached and the cavalry has a mission of delaying hostile motorized force, which is a threat from the flank, then the reconnaissance detachment might well be attached to the cavalry squadron for use with it or, since a Lieutenant Colonel normally commands the infantry element and a Major the cavalry squadron, the cavalry might be attached to the Reconnaissance Detachment to delay the hostile threat.

(6) When operating with an advance guard, it may act as the pivot of maneuver, or, as the maneuvering element. If the Reconnaissance Detachment is already in contact with the enemy, it may revert to the control of the advance guard commander, or, the higher commander may order it relieved by the advance guard in order to send it on another mission.

(7) Units may be attached to outposts to give additional security. Small detachments from the main detachment may be sent well out to the front and flanks on patrol.

(8) In a pursuit a Reconnaissance Detachment might be used as a mobile element to operate against the flanks and head of a retreating force, and to deliver demoralizing fire from unsuspected localities.

(9) Demolitions may become the primary mission of the detachment, and in this event, it could be specially organized with a high percentage of engineer demolition units.

(10) It might be used as a special escort for the division trains where there is a mechanized threat.

(11) It might be used as a special reinforcement for the troops protecting the lines of communication.

(12) It might be used to temporarily fill a gap between units.

(13) Finally, it will be a constant threat to the security forces of the enemy.

6. ORGANIZATION.—*a.* Whenever conditions warrant, the commanders of reinforced brigades, of divisions, or of corps will organize or improvise reconnaissance detachments and will use them as the situation demands. The reconnaissance detachments have no *permanent* organization, and must be improvised to meet the needs of a particular situation. They are composed of small detachments, armed with machine guns and rifles, transported in motor vehicles. The detachment may or may not be reinforced with truck-drawn artillery, engineers, signal, and chemical troops, depending on its mission.

b. Number.—(1) In a reinforced brigade, there will normally be motor transportation available for only *one* Reconnaissance Detachment.

(2) With a division, *two* such detachments may be organized.

c. Strength.—(1) The Reconnaissance Detachment will ordinarily consist of one rifle company from the advance guard battalion, and one machine-gun company taken from the battalion which will probably be used in the reserve in case of combat. All will be transported in trucks. In addition there will usually be a truck-drawn battery of light artillery, and entrucked engineers, signal, chemical, and other units.

(2) As far as is practicable the headquarters personnel and equipment for the Reconnaissance Detachment should be taken from the signal company, or detachment. Some of it may have to come from the battalion headquarters from the battalion from which the Lieutenant Colonel and the machine-gun company are taken. (Note: The signal detachment of a reinforced brigade can furnish the headquarters for one detachment. The signal company (reinforced) of a division can furnish the headquarters personnel for two or perhaps three such detachments.

7. COMMAND.—*a.* The Reconnaissance Detachments are *fundamentally* agencies of the corps, division, or reinforced brigade commander.

In a division, for example, they may operate initially under brigade control, or they may be held under the control of the higher commander, initially, and then one or both be turned over to the column commanders for definite missions if the situation requires such action; or, two or more such groups may be combined and operate directly under the higher commander.

b. Each detachment will be commanded by a Lieutenant Colonel of Infantry taken from the battalion which furnishes the machine-gun company.

8. PLACE IN COLUMN.—The Reconnaissance Detachment will normally march by bounds in the interval between the rear of the foot elements of the security detachment and the head of the main body.

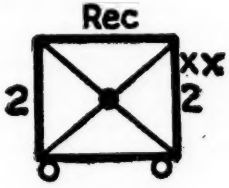
9. MOTOR TRANSPORTATION.—The motor transportation (except for truck-drawn artillery) or other attached units that are normally motorized, will come from the division Quartermaster Regiment. The size of such detachment must be limited by the number of trucks given in any problem as available from the Quartermaster Regiment or as shown in Tables of Organization.

10. PROTECTION FOR THE DETACHMENT.—In the usual situation the detachment will be moving in a zone protected by the horse cavalry and the foot elements of the security detachment. The depth of this zone may be from 15 to 25 miles, depending on the location of the horse cavalry. If the detachment is sent out ahead of the horse cavalry it should be escorted by the armored cars and scout cars, in addition to the protection it will be able to give by its own elements.

11. LIAISON.—In all situations provision must be made for liaison and communications with air corps, with the cavalry, and with the main body through its advanced message center.

12. RECONNAISSANCE AGENCIES WITH THE DETACHMENTS.—When Reconnaissance Detachments are formed, special reconnaissance agencies may be detailed to accompany them on special missions. For example, there may be such groups from the artillery, from the brigades, or staff officers from the division staff (as representatives of G-2 or G-3) or, the officers with the various detachments may perform the duties of reconnaissance for their higher units.

13. SYMBOL.—The symbol shown below is tentatively adopted for indicating Reconnaissance Detachments. The brigade, division, or corps designation will be shown on the right of the basic symbol, and the number of the detachment (if more than one) in a particular unit, will be shown on the left of the basic symbol. Example: Reconnaissance Detachment No. 2 of the 2d Division.



GENGHIS KHAN AND THE MODERN MECHANIZED FORCE

AN HISTORICAL EXAMPLE

	Paragraph
Mongol conquests	1
Organization and armament	2
Strategy and tactics	3
Lessons	4

1. MONGOL CONQUESTS.—*a.* In 1908, Theodore Roosevelt, in his preface to Curtin's *The Mongols*,[1] wrote the following:

> "Indeed it is extraordinary how ignorant even the best scholars of America and England are of the tremendous importance in world history of the nation-shattering Mongol in-

[1] *The Mongols*, a History, by Jeremiah Curtin, Little, Brown, and Company, Boston, 1908. Preface by Theodore Roosevelt.

vasions—the most stupendous fact of the thirteenth century—the rise of Genghis Khan and the spread of the Mongol power from the Yellow Sea to the Adriatic and the Persian Gulf. As a matter of fact the recent military supremacy of the white or European races is a matter of only some three centuries. For the four preceding centuries, that is, from the beginning of the thirteenth to the seventeenth, the Mongol and Turkish armies generally had the upper hand in any contest with European foes, appearing in Europe always as invaders and usually as conquerors... When the thirteenth century opened, Genghis Khan was merely one among a number of other obscure Mongol chiefs... At the moment Europe had lost fear of aggression from either Asia or Africa... Into this world burst the Mongol. All his early years Genghis Khan spent in obtaining first the control of his own tribe, and then in establishing the absolute supremacy of this tribe over all its neighbors. In the first decade of the thirteenth century, this work was accomplished. Out of the Mongol horse-bowmen and horse-swordsmen he speedily made the most formidable troops then in existence. They were inconceivably formidable in battle, tireless in campaign and on the march, utterly indifferent to fatigue and hardship, of extraordinary prowess with bow and sword. To the Europeans who cowered in horror before them, the squat, slit-eyed, brawny horsemen, with 'faces like the snouts of dogs,' seemed as hideous and fearsome as demons, and as irresistible by ordinary mortals... They conquered China... India their descendents conquered... Persia fell into their hands. Their armies, every man on horseback, marched incredible distances and overthrew whatever opposed them. They struck down the Russians at a blow... They crushed the Magyars in a single battle... They overran Poland and destroyed the banded knighthood of North Germany in Silesia. Western Europe could have made no adequate defense."

b. "No second Tours," writes another author,[2] "saved western Europe from inevitable disaster. Its armies, capable only of moving in mass, led by reigning monarchs . . ., were valiant enough, but utterly unable to prevail against the rapidly-maneuvering Mongols led by generals such as Subotai and Mangu and Kaidu—veterans of a lifetime of war on two continents. But the war never came to a final issue. A courier from Karakorum brought the Mongols the tidings of Ogatai (Khan)'s death and a summons to return to the Gobi."

c. These accomplishments were not due to accident. They may be traced to the superb experienced leadership of the Mongols, and to their organization, armament, and tactics. The Mongols never enjoyed superiority of total numbers. They were a disciplined army of invasion, not a migratory mass like the Huns. Howarth (Volume I) gives the following data covering the initial Mongol invasion of Karesmia (vicinity of Persia) in the year 1220 AD:

Imperial Guards	1,000
Center	101,000
Right wing	47,000
Left wing	52,000
Other contingents	29,000
	230,000

This was the largest force ever assembled by Genghis. Lamb estimates that of these probably not more than 150,000 were actually front-line troops (Mongols). At Genghis' death his army is known

[2] *Genghis Khan, The Emperor of All Men*, by Harold Lamb, Robert M. McBride & Co., New York, 1927, p 218.

to have been 130,000. The total population of the Gobi lands was only about 1,500,000; it could hardly have provided more than 200,000 effectives. Brigadier General Sir Percy Sykes, in his *Persia*, refers to "the Mongols, who were numerically weak and fought thousands of miles from their base."[3]

d. Another commentator states:

"The manner in which he (Genghis) moved large armies over vast distances without an apparent effort, the judgment he showed in the conduct of several wars in countries far apart, his strategy in unknown regions, always on the alert, yet never allowing hesitation or over-caution to interfere with his enterprises, the seiges he brought to a successful termination, his brilliant victories, a succession of 'suns of Austerlitz,' all combined, make up the picture of a career to which Europe can offer nothing that will surpass, if indeed she has anything to bear comparison with it."[4]

2. ORGANIZATION AND ARMAMENT.—*a.* The organization and equipment of the Mongol army were the result of a long experience in war, and a keen appreciation of fundamental factors. Protection, movement, and hitting power were furthered by every available means, and existing agencies were rapidly improved by the prompt adoption of every useful device which the Mongols found employed by their enemies.

b. The Mongol organization and armament, in their effectiveness and simplicity, afford valuable lessons for use with modern mechanized forces.

c. The army of invasion of China, in 1211 AD, was held together by the sternest discipline, and made up of mounted men only. The units of this force were ten, one hundred, one thousand, and ten thousand warriors. Each man had a strong rawhide armor and helmet; he carried a lance and a saber, with an ax, a bow, and quiver; he was followed by a number of horses, which had no food save that which they found as they traveled. Immense herds of cattle were driven in rear of the army. In time of forced marches, each man carried with him some milk and a small portion of flesh food.[5]

Each man had a leather kit (or bag) which could be inflated for crossing streams. It was forbidden any warrior of the horde to forsake his comrades—the men of his *ten*. Or for the others of the *ten* to leave behind them a wounded man.[6]

d. For the initial invasion of Karesmia in the winter of 1219-20, the horde was better equipped than ever before. The shock divisions had their horses encased in lacquered leather—red or black. Every man had two bows, and a spare arrow case, covered to protect it against dampness. Their helmets were light and serviceable, with a leather drop, iron-studded, to guard the neck behind. Only the regiment of the Khan's guard had shields. Besides the saber, the men of the heavy cavalry had axes hanging from their belts, and a length of rope—lariats for pulling siege engines and bogged-down carts. The emergency rations were smoke-cured meat and dry milk curds, which could be heated in water.

A new division, recruited from China, consisted of 10,000 men skilled in building and operating the *ballistae* (guns), *mangonels* (howitzers), and fire-throwers (including heavy siege engines).

This invasion involved crossing very difficult mountains in severe winter weather with practically no roads, merely trails.[7]

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[3] Lamb, p 207.
[4] Demetrius Boulger, *A Short History of China*, p 100.
[5] Curtin, p 83.
[6] Lamb, pp 75 & 150.
[7] Lamb, pp 18 & 120.

e. That Genghis had a thorough appreciation of the requirements of good organization, is indicated by the fact that he worked out a system of mobilization. Arms were stored, and issued for each campaign. The *Yassa* (Laws of Genghis Khan) contains the following prescription: "The ruling that divides men of the army into tens, hundreds, thousands, and ten thousands is to be maintained. This arrangement serves to raise an army in a short time, and to form the units of commands."[8]

f. The *tuman* (10,000 men) constituted the division; the corps (usually about 30,000) consisted of the appropriate number of tumans. "Europe's armies, capable of moving only in mass, and led by reigning monarchs . . . ., were utterly unable to prevail against the rapidly-maneuvering Mongols, led by Generals (who were) veterans of a life-time of wars on two continents. . . ." Fra Carpini, sent by the Pope to the Mongol Khan after the terrible invasion of 1238-42 to exhort him to cease the slaughter of Christians, said:

"The Tartars fight more by stratagem than by force. They are less numerous than Europeans, and lack their physical stature and strength."

He urged European monarchs to model their military systems on the Mongol, and "under the same vigorous laws of war." "No single province or kingdom can resist the Mongol."

"The army should by no means be drawn up in one body, but in many divisions."

He counselled scouts to be sent out on every side; constant vigilance.

"The princes of Christendom ought to have many soldiers armed with strong bows, cross-bows, and artillery, which the Turks dread. Besides these, there ought to be men armed with good iron maces, or with axes having long handles. . . . . .Our men ought to have armor of proof for themselves and horses."[9]

g. The Emperor Frederick II wrote the King of England (about 1242) to the effect that "formerly the Tatars were covered with leather and armor of iron plates, while now they are equipped with finer and more useful armor, the spoils taken from Christians. Moreover, they are mounted on better horses, sustain themselves on choicer foods, and wear garments less rude than our own."[10]

3. STRATEGY AND TACTICS.—*a.* Mongol strategy was, in turn, based on a keen appreciation of protection (security and surprise), movement (utilization of mobility to divide the enemy, encircle him, and defeat him in detail), and of hitting power.

b. (1) Prior to the first invasion of China, Genghis loaned the Chinese (Chin) Emperor several divisions to assist in a campaign. These forces collected information as to the country. Before launching his invasion, Genghis first insured the safety of his flank and rear by both military and political action. The invasion was preceded by a horde of spies.

(2) The actual invasion of China (1211 AD) was undertaken as follows: a line of scouts in pairs (about 200 men); followed by a strategical advance guard of 30,000, each with at least two horses; followed by the main body in three groups: a center of about 100,000, and two wings totalling about as many more together.

c. The initial invasion of Karesmia (1219-20) was preceded by spies. Advance detachments of scouts and foragers preceded the army. A detached corps threatened the enemy's flank and rear as he marched north to meet the main body. When he re-formed to meet this threat, the main forces moved on to the southwest and drew him off again toward them, whereupon a further detachment from the

[8] Lamb, p 201.

[9] Lamb, pp 218-219.

[10] Lamb, p 219.

southern Mongol force circled to the south and west around his rear. When he turned south again to meet this threat, the main forces, by a wide movement through a difficult desert region, placed themselves in the center of Karesmia, across the communications to its western parts.

d. The usual process of invasion was: a swarm of spies and a period of questioning informers; an invasion on a broad front, each subdivision on a fixed objective, but with liberty of maneuver en route; investment of fortified towns by detachments with siege engines, while the mass moved on to find the hostile army and leader; then a concentration against the hostile force by surprise, a wide maneuver, or a feigned flight and an ambush; if the hostile force massed and fought well, the Mongols allowed it to retreat and attacked it en route.

e. The encircling movement was the favorite maneuver of the Mongols, the *tulughma* (standard sweep) that turns an enemy flank and takes him in rear.

f. Campaigns were preceded by thorough planning, higher commanders being summoned to a series of conferences for that purpose.

g. That tactical instruction was also carried on continuously, is indicated by an incident during the campaign of pacification after the initial invasion of Karesmia. A Mongol division was defeated by Jelal ed-Din, son of the dead Shah; Genghis later took the defeated division commander over the ground, and pointed out his errors.

h. The Mongols worked out a battle-drill, utilizing signals (especially flags) and mounted messengers, very closely resembling the formations and maneuvers of modern mechanized forces. They astonished foreign observers by the speed, the accuracy, and the silence with which they performed their tactical evolutions.

i. Examples of Mongol maneuver both strategically and tactically may be taken from the Invasion of Middle Europe in 1241 AD (see diagram).[11]

4. LESSONS.—*a.* It is hardly necessary to point the moral in this case. The Mongols used all available means of clothing, equipment, weapons, and transportation, to develop the best possible combination of protection, mobility, and fire-power.

b. They maintained a high standard of discipline.

c. They planned their campaigns and battles carefully, and carried them out with energy. They made maximum use of secrecy, deception, and surprise.

d. They moved on as broad a front as conditions permitted, with a view to executing a wide maneuver directed at the enemy's rear. They fixed the enemy with part of their forces, either by attack or defense or by a combination of these, while the maneuvering force was moving wide of the flank to reach the enemy rear.

e. Tactically, they confounded their enemy by the speed and precision of their movements, by the accuracy of their fire, and by the rapidity, unity, and continuity of the maneuver with which they pressed home their attack.

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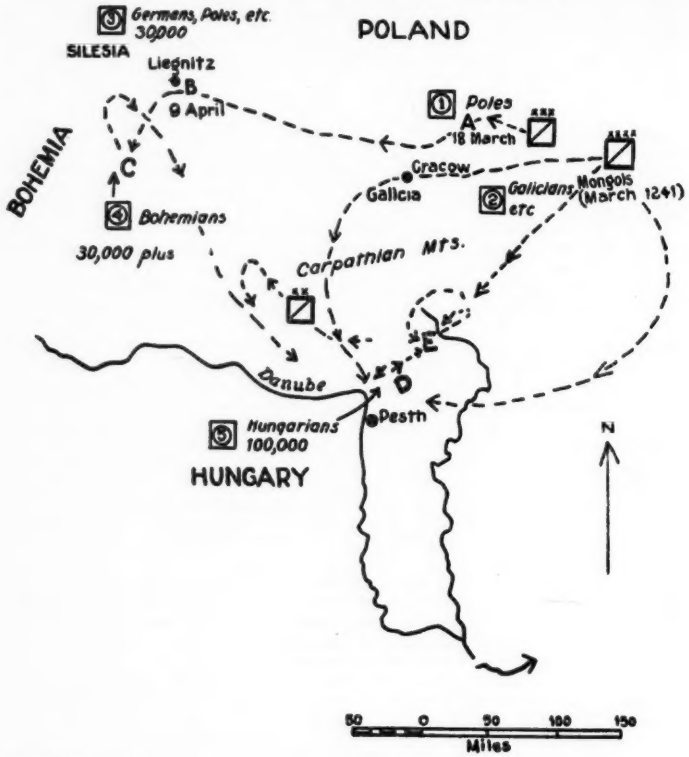
[11] Lamb, pp 60, 83-86, 120 et seq., 172, 182, 210-211.

MONGOL INVASION OF MIDDLE EUROPE (1241)



EXPLANATION:

Mongols concentrated as shown, opposed by:
(1) Boleslas of Poland
(2) Mieceslas of Galicia
(3) Prince Henry of Silesia
(4) Wenceslas of Bohemia
(5) Bela of Hungary.

If Mongols move southwest, Poles left in rear; if west, Hungarians on their left.

Batu (son of Genghis Khan), comdg, *Subotai*, Chief of Staff, detaches a corps, under *Kaidu*, to secure the north flank.

This corps moves to A, defeats Poles, 18 March; burns Cracow, moves to B, destroys Prince Henry's force in battle of Liegnitz, 9 April; moves to C, maneuvers, keeping Bohemians occupied; leads them north, then breaks away and rejoins main Mongol force.

In the meantime the latter (*Batu*) moves through Carpathians by three routes, destroying Galician force and other small groups, concentrates at D early in April (before battle of Liegnitz); detaches a division to maintain communication with *Kaidu* (detached corps to north).

Main Mongol force (*Batu*) then retreats before Hungarians to point east of stream at E. When Hungarians bivouac at E, Mongols take up counteroffensive to west across stream, sending a detachment well around to north and west.

After long struggle the Mongol maneuvering force strikes Hungarian rear at E, shattering Hungarian army.

Mongols allow remnants to flee to west. All Mongol forces, joining in pursuit, destroy Hungarian army.

Section 6

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Section 7

READERS' GUIDE AND SUBJECT INDEX

A

Air Arm
Ammunition
Animals
Antiaircraft Artillery
Antiaircraft Defense
Antigas
Antitank
Applicatory Exercises
Armaments
Armies (See country)
  Command & Staff
  Mobilization
  Organization & Equipment
  Training
Armored Cars
Art of War Strategy
Artillery (Other Arms, similarly)
  Command & Staff
  Organization & Equipment
  Training Tactics
Attack

B

Breakthrough Operations

C

Camouflage
Cavalry
Chemical Warfare Service
Civilian Conservation Corps
Coast Artillery
Command, Staff & Logistics
Counterattack

D

Defiles
Delaying Action
Disarmament

E

Engineers
Envelopment
Equitation

F

Fire Superiority
Flank Operations
Formations, Battle
Fortifications
France (Army of)
Future Warfare

G

Gas & Smoke (Use of)
Geography (Military)
Germany (Army of)
Government (Military)
Great Britain (Army of)

H

History (General)
Hygiene

I

Infantry
Intelligence (Military)
International relations
Italy (Army of)

J

Japan (Army of)
Joint Operations

K

L

Large Units, Organization & Tactical Functions (Army, Corps & Division)
Law, Military & International
Liaison

M

Machine Guns
Maneuvers
Map Problems
Marches
Marine Corps
Mechanization Mechanized Forces
Medical Service
Meeting Engagement
Mobilization
Motorization

N

National Defense
Naval Warfare
Navies (See country)
Night Operations

O

Obstacles
Ordnance Service
Organization
Overseas Expeditions

P

Penetration
Position Warfare
Principles of War
Pursuit

Q

Quartermaster Service

R

Raids
Riots
River Crossings

S

Security
Signal Service
Special Warfare
Supply

T

Tactics Operations
  Evolution of Tactics
  General topics
  Defensive combat
  Offensive combat
  Reconnaissance
  Special warfare
  Troop movements
Tanks
Technology
Terrain
Topography Surveying
Transportation
Turning Movements

U

United States (Army of)

V

Veterinary Service

W

War Peace
Wars (Ancient, Medieval, Modern)
World War
  E—General Military History
  F—Zone of Interior
  G—Arms & Services
  H—Military Conduct of the War in the Field
  J—Campaigns & battles
  L—Naval History

X

Y

Z

List of Periodicals Indexed

and

Key to Abbreviations

A&N Jour—Army & Navy Journal

A&N Reg—Army & Navy Register

A Med Bul—Army Medical Bulletin

AN&AF Gaz—Army, Navy & Air Force Gazette (Great Britain)

A Ord—Army Ordnance

A Quar—Army Quarterly (Great Britain)

Bul Belge Mil—Bulletin Belge des Sciences Militaires (Belgium)

Can Def Quar—Canadian Defence Quarterly (Canada)

Cav Jour—Cavalry Journal

Cav Jour [GB]—Cavalry Journal (Great Britain)

Chem War—Chemical Warfare Bulletin

CA Jour—Coast Artillery Journal

FA Jour—Field Artillery Journal

Ftg Forc—Fighting Forces (Great Britain)

Inf Jour—Infantry Journal

Jour R Art—Journal Royal Artillery (Great Britain)

Jour RUSI—Journal of the Royal United Service Institution (Great Britain)

Jour USII—Journal of the United Service Institution of India (Great Britain—India)

MC Gaz—Marine Corps Gazette

Mil Mitt—Militärwissenschaftliche Mitteilungen (Austria)

Mil-Woch—Militär-Wochenblatt (Germany)

Mil Eng—Military Engineer

Mil Surg—Military Surgeon

Nav Inst Proc—Naval Institute Proceedings

Naz Mil—Nazione Militare (Italy)

Pion—Pioniere (Germany)

QM Rev—Quartermaster Review

Rev Ej Mar—Revista del Ejercito y de la Marina (Mexico)

Rv l'Air—Revue de l'Armée de l'Air (France)

Rv d'Art—Revue d'Artillerie (France)

Rv de Cav—Revue de Cavalerie (France)

Rv d'Inf—Revue d'Infanterie (France)

Rv Gen Mil—Revue du Génie Militaire (France)

Rv Mil Fran—Revue Militaire Francaise (France)

Rv Mil Suisse—Revue Militaire Suisse (Switzerland)

Riv Art e Gen—Rivista di Artiglieria e Genio (Italy)

RAF Quar—Royal Air Force Quarterly (Great Britain)

Roy Eng Jour—Royal Engineers Journal (Great Britain)

Roy Tk C Jour—Royal Tank Corps Journa (Great Britain)

Sanct Chris—Sanct Christophorus (Germany)

SC Bul—Signal Corps Bulletin

Wehr Monat—Wehrtechnische Monatshefte (Germany)

Ws & Wr—Wissen und Wehr (Germany)

For A—Foreign Affairs

For Pol Rep—Foreign Policy Reports

R Table—Round Table (Great Britain)

Jan—January
Feb—February
Mar—March
Apr—April
May—May
Jun—June
Jul—July
Aug—August
Sep—September
Oct—October
Nov—November
Dec—December

A

ABYSSINIA

See Ethiopia.

ADDRESSES

The human element. (Inf Jour—Sep-Oct 1935)

AERONAUTICS (COMMERCIAL)

The Federal Airways system. (QM Rev—Sep-Oct 1935)

AERIAL WARFARE

Bringing the bombers home. Radio aids to accurate piloting. (AN&AF Gaz—17 Oct 1935)
The lawless arm. (A Quar—Oct 1935)
Some facts about bombardment aviation. (Inf Jour—Sep-Oct 1935)
The air attack against Everest. (Jour R Art—Oct 1935)
Aerial danger. (Rev Ej Mar—Jun 1935)
The dangers of an aviator. (Rev Ej Mar—Apr 1935)
Principles of the Douhet doctrine. (Rv l'Air—Apr 1935)
The future of aero-chemical warfare. (Rv Mil Suisse—May 1935)
French and British theories of aerial warfare. (Mil-Woch—11 May 1935)
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AIR ARM

Command and Staff

Aircraft procurement policy. (A&N Reg—31 Aug 1935)
Principles of the Douhet doctrine. (Rv l'Air—Apr 1935)
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The future of aero-chemical warfare. (Rv Mil Suisse—May 1935)
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Organization and Equipment

The flight surgeon. (A Med Bul—Jul 1935)
Research in aviation medicine. (A Med Bul—Jul 1935)
The gun plane. (Inf Jour—Sep-Oct 1935)
Winged armies. (Jour RUSI—Aug 1935)
The army and the air. (Jour RUSI—Aug 1935)
The development of the aircraft carrier. (Jour RUSI—Aug 1935)
Germany's air force. (Jour RUSI—Aug 1935)
The early development of aviation medicine in the United States. (Mil Surg—Sep 1935)
The present need for airplane ambulances by the United States Army. (Mil Surg—Sep 1935)
The Federal Airways system. (QM Rev—Sep-Oct 1935)
Observation. (RAF Quar—Oct 1935)
Mesopotamian meanderings. (RAF Quar—Oct 1935)
Aircraft and combat vehicles versus ground troops. [See Section 2]
Current ideas on pursuit aviation. (Bul Belge Mil—Apr 1935)
Aviation equipment of various nations. (Rv l'Air—Apr, May, Jun 1935)
Sound ranging of aircraft, methods and apparatus. (Rv l'Air—Apr, May 1935)
Night pursuit, monoplace or biplace? (Rv l'Air—May, Jun 1935)
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The gun plane. (Inf Jour—Sep-Oct 1935)
"Nous verrons." (Jour R Art—Oct 1935)
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See also: Wars Africa—Italy-Abyssinia (1935)

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F

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H

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Italy's action against Abyssinia. (Mil-Woch—25 Mar 1935)

J

JAPAN (ARMY OF)

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Motorization of the Japanese Army. [See Section 2]
Latest data relative motorization of foreign armies. (Sanct Chris—Jun 1935)

JAPAN (NAVY OF)

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Use of artillery and mines in the Dardanelles. (Ws & Wr—May 1935)

L

LARGE UNITS

Army

The battle of the Meuse River. (FA Jour—Sep-Oct 1935)
The sequence of a battle from the viewpoint of the company or dismounted squadron. (Rv de Cav—Mar-Apr 1935)
Experiences of a German attack division during three offensives in 1918. (Ws & Wr—May, Jun 1935)

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LATVIA (ARMY OF)

The armies of the Baltic countries. (Rv d'Inf—Apr 1935)
Latest data relative motorization of foreign armies. (Sanct Chris—Apr, Jun 1935)

LAW (MILITARY AND INTERNATIONAL)

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LITHUANIA (ARMY OF)

The armies of the Baltic countries. (Rv d'Inf—Apr 1935)
Latest data relative motorization of foreign armies. (Sanct Chris—Apr, Jun 1935)

LUDENDORFF, General Eric von (1865-)

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LYAUTEY, Marshal Hubert (1854-1934)

Lyautey, Morocco, and the N.W.F.P. (Jour USII—Jul 1935)

M

MACHINE GUNS

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The modern Genghis Khan. [See Section 2]
Approach marches. [See Section 2]

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Upper-air soundings by aërograph. (Nav Inst Proc—Aug 1935)

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Military customs and courtesies. (Rev Ej Mar—Apr, May, Jun 1935)

MILITARY AID TO THE CIVIL POWER

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MINING

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Can the speed of modern cavalry be increased? (Mil-Woch—4 Apr 1935)
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MOBILE WARFARE

The modern Genghis Khan. [See Section 2]
Thoughts on the defense against tanks in a war of movement. (Rv d'Inf—Jun 1935)
Employment of artillery in mobile warfare. (Riv Art e Gen—Apr-May 1935)

MOBILIZATION

Armies, Mobilization of

Wartime selection, training, and replacement of Signal Corps personnel. (SC Bul—Sep-Oct 1935)

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MOTORIZATION

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Motorization of large units. [See Section 2]
Motorization of the Japanese Army. [See Section 2]
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The great cavalry problem. (Mil-Woch—18 Apr 1935)
More data on army cavalry and motorized units. (Mil-Woch—25 Apr 1935)
Reconnaissance forces and fast troops. (Mil-Woch—25 Apr 1935)

N

NAPOLEON I, Emperor of the French (1769-1821)
A doubt about Napoleon. (Cav Jour [GB]—Oct 1935)

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Coast Guard problem. (A&N Jour—28 Sep 1935)
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NAVIGATION

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NETHERLANDS (ARMY OF)

Aviation equipment of various nations. (Rv l'Air—Jun 1935)

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NIGHT OPERATIONS

The battle of Sedgemoor: Another version. (Jour USII—Jul 1935)
Tank attacks at night. [See Section 2]
Night pursuit during the War, 1914-1918. (Rv l'Air—Apr 1935)
More memories of "pursuit," 1915-1918. (Rv l'Air—May 1935)
Night pursuit, monoplace or biplace? (Rv l'Air—May, Jun 1935)
Tactical and strategic significance of darkness. (Mil-Woch—25 Apr, 4 May 1935)

O

OBSTACLES

Thoughts on the defense against tanks in a war of movement. (Rv d'Inf—Jun 1935)
Rumania: The defense against tanks and armored cars. (Rv d'Inf—Jun 1935)
The inundation of the battle field. (Riv Art e Gen—Mar 1935)

ORDNANCE

The problem of munitions in the World War and in a future war. (Riv Art e Gen—Mar 1935)

P

PHOTOGRAPHY

Aerial

The air attack against Everest. (Jour R Art—Oct 1935)
Mapping by the use of aerial photographs. (Mil Eng—Sep-Oct 1935)

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Marshal Pilsudski. (A Quar—Oct 1935)

POLAND (ARMY OF)

Latest data relative motorization of foreign armies. (Sanct Chris—Apr, Jun 1935)

PRINCIPLES OF WAR

The principles of war and the R.A.F.—The offensive. (RAF Quar—Oct 1935)
The modern Genghis Khan. [See Section 2]
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Organization, armament, ammunition and ammunition expenditures of the German field artillery during the World War. (FA Jour—Jul-Aug 1935)

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Army promotion bill signed, effective August 1. (A&N Jour—3 Aug 1935)
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Promotion in the war block. (Jour USII—Jul 1935)

PROPAGANDA

Propaganda—a military weapon! (Mil-Woch—11 Apr 1935)

PSYCHOLOGY (MILITARY)

Psychology as an aid to historians and leaders. (Mil-Woch—25 Mar 1935)

Q

QUARTERMASTER SERVICE

The Federal Airways system. (QM Rev—Sep-Oct 1935)
Early military records and memoranda. (QM Rev—Sep-Oct 1935)

R

RAIDS

Two cavalry raids of the Great War. (Cav Jour [GB]—Oct 1935)
"Nous verrons." (Jour R Art—Oct 1935)

RECONNAISSANCE

Use of the sun in map-reading and reconnaissance. (Cav Jour [GB]—Oct 1935)
Chemical security—Part II. (Inf Jour—Sep-Oct 1935)
Approach marches. [See Section 2]
The formations of motorcyclists in Germany. (Bul Belge Mil—Apr 1935)
A reconnaissance detachment in action. (Naz Mil—May 1935)
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RIVER CROSSINGS

The battle of the Meuse River. (FA Jour—Sep-Oct 1935)
Crossing the Nile. (Roy Eng Jour—Sep 1935)
Forced passage of the Yser Canal, 31 July 1917. (Rv Gen Mil—May-Jun 1935)
The work of engineers at river crossings. (Riv Art e Gen—Apr-May 1935)

ROUTES COMMUNICATIONS

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The inundation of the battle field. (Riv Art e Gen—Mar 1935)

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U

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W

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ASIA

INDIA

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EUROPE

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The struggle against overwhelming odds. [See Section 1]
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SOUTH AMERICA

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UNITED STATES

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J—Campaigns and Battles

AFRICAN AREA

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ASIATIC AREA—TURKISH THEATER

Dardanelles (Gallipoli) Front

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EUROPEAN AREA—WESTERN THEATER

1914

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1916

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1917

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WEAPONS

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Lessons from the Chaco War. [See Section 2]
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WITHDRAWAL

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Y

YUGOSLAVIA (ARMY OF)

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